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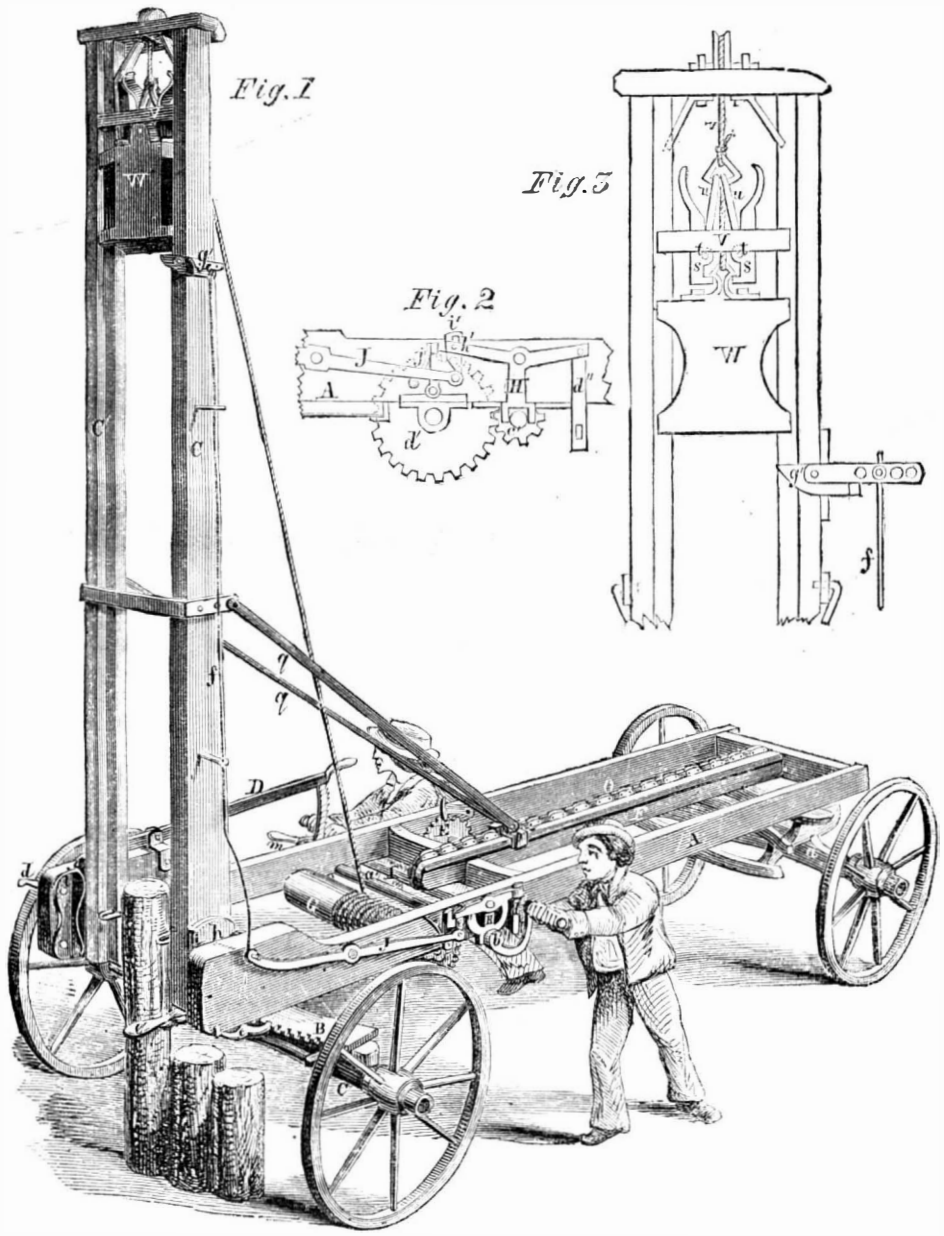
NEW PILE DRIVER.

Piles have sometimes to be driven in very inconvenient situations on which to place the driver, and indeed it is very often that the frame of the driver has to be mounted on trusses and stays to bring the guides on which the monkey or weight slides perfectly perpendicular so that it will not be obstructed in its fall on the head of the pile. The subject of our engraving is a machine or frame that forms a portable pile-driver, and one that can be placed on any ground, be it ever so unequal, and the guides so adjusted as to be perfectly perpendicular, so that the weight will not be liable to catch, and will always be ready to be applied to the work. Fig. 1 is a perspective view of the whole, in operation. Fig. 3 is a front elevation of part of the top, and Fig. 2 is a detached piece of the framing to illustrate some details which will be afterwards described.



PLACE'S IMPROVED PILE DRIVER.

A is a rectangular frame, the back part of which is attached to an axle, *a*, and the front part rests on a curved rack plate, B, which is secured to the upper surface of the front axle, *c*, and to any part of which the frame can be secured by a catch, *d*, attached to one side of the frame. The frame is held on to this plate by guides, and it can be moved along the plate by an adjustable pawl, *e*, that can be set so as to move it in either direction, and the pawl is operated by a lever, *e′*.

In the front of the frame, two weight or monkey guides C, C′, are placed, which are connected at their upper ends by a traverse bar, and they are also connected at their lower ends. The lower part of the guide, C, is connected with the frame by a universal joint at *h*, and the lower part of C′, is connected by a sliding joint, *i*, formed of a guide plate, to which C′ is pivoted, that moves in a socket and can be placed and secured in any position by the lever, D, that has a rack on its end, and a wedge, *m*, to secure it in a staple on the frame.

By attaching the guides in this manner they may be lowered so as to rest horizontally on the frame A, for convenience of transportation, or may be raised to a vertical position when desired for use. This operation of the guides is effected by means of a windlass, E, and an endless chain to which a slide, *p*, placed on a horizontal guide bar, F, in the frame, is attached, and this slide being attached by rods, *q q*, with the guides, enables them to be raised and lowered by the windlass. Besides this raising and lowering, the guides may be tilted or canted laterally by operating the lever D, the universal joint at *h*, permitting such movement.

Between the two guides C, C′, a weight or monkey, W, is placed and allowed to slide freely up and down. This weight has a catch, on its upper end, and above this is a catch block, V, which is fitted between the guides C, C′, and allowed to slide freely up and down. This catch block (better seen in Fig. 3) is simply a bar having two jaws, *s s*, fitted in and working on pivots, *t*. Each jaw, *s*, has a link, *u*, fitted to it, to the upper ends of which the rope *v*, is attached, which is connected with a windlass, G. On the underside of the frame a shaft, *a′*, is placed, and a pinion, *c′*, is also placed on it, which gears into a toothed wheel, *d′*, on the windlass G. Fig. 2 is a diagram showing these parts. A crank, *b′*, is on one end of the pinion. The bearing of *a′*, is at the lower end of a T-shaped lever, H, that is attached to the frame. One end of the upper part of the lever H, is connected by a link, *d″*, with a lever, I, placed transversely under the frame A, and the opposite end of the lever H, is connected by a link, *e″*, with a lever, J, the front end of which is connected by a rod, *f*, with a jointed stop or button, *g′*, on the guide C. The link, *e′* is connected with the lever H, by means of a pin, *h′*, on said lever, fitting in an oblong slot, *i′*, in the upper end of the link, and a catch, *j′*, which is attached to the frame A, fits under the front end of the lever H, and retains the pinion *c′*, in gear with the wheel *d′*.

The operation will be readily seen. The monkey guides C, C′, are placed in a vertical position by adjusting the lever D, and turning the handles E, either or both, as occasion may require. The frame A, also, is adjusted laterally so as to bring the monkey directly over the pile to be driven. The operator then raises the end of lever I, and thereby raises the front end of lever H, so that the catch *j′*, will pass under the front end of the lever and retain the pinion *c′*, in gear with the wheel *d′*.

The shaft *a′*, is then turned and motion is given windlass G; the rope *v*, elevating the monkey W, in consequence of the catch block F, being connected with it, the jaws *s*, *s*, being in the catch. When the catch block reaches the top of the guides C, C′, the monkey is released from it in consequence of the jaws, *s*, *s*, striking against oblique bars at the upper parts of the guides. The monkey in descending strikes the button *g′*, which actuates the lever J, the catch *j′*, being thrown out from underneath the front end of lever H, and the pinion, *c′*, is thereby thrown out of gear with wheel *d′*. As soon as the pinion *c′*, leaves the wheel *d′*, the power shaft, *a′*, is disconnected from the windlass G, and the catch block F, descends and almost immediately follows the monkey W and connects with it ready for a succeeding elevation. Thus it will be seen that the monkey may be rapidly operated, for comparatively little or no time is lost in applying the catch block to the monkey, the work being done automatically and expeditiously.

The inventor is Thomas Place, of Alfred Centre, N. Y., and either he or Wm. M. Sanders, of the same place, who owns half the patent, will be happy to give any further information. Patent dated May 3, 1859.

Men resemble the gods in nothing so much as in doing good to their fellow-creatures.

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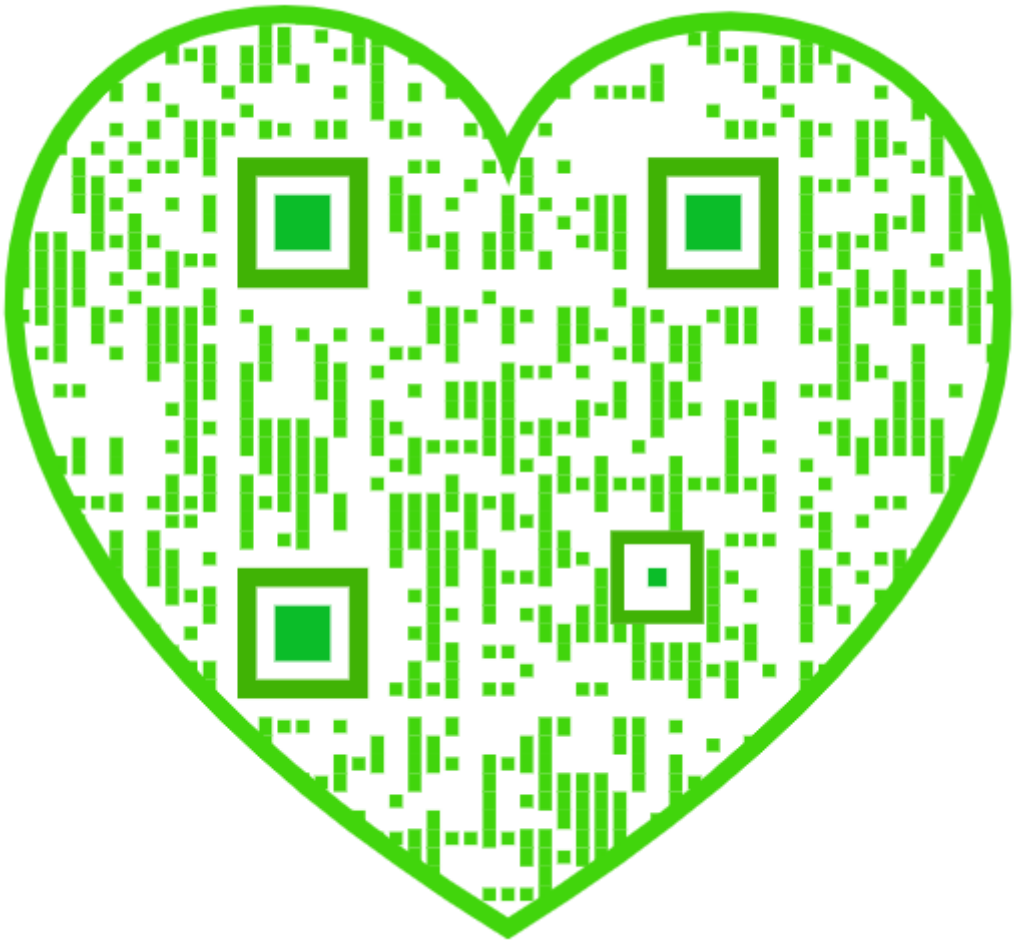

THE UNITED STATES PATENT OFFICE.

To the student in pursuit of knowledge upon any branch of science and invention there is no museum or collection of material in this country at all to compare with that so beautifully and artistically arranged in the spacious halls and galleries of the Patent Office. Like the other institutions of the Federal Government, the growth of this office has increased with the development of the resources and rapid expansion of the power and population of the republic. A glance at its history shows that such an establishment early attracted the attention of the wise and able men of the revolutionary era. Hence we find that, on the 10th of April, 1790, Congress passed an act authorizing the Secretary of State, the Secretary of War, and the Attorney-general, or any two of them, to grant patents for such new inventions and discoveries as they should deem sufficiently useful and important. This act, which originated the Patent Office, was repealed, and a new act passed on the 21st of February, 1793. Under this latter act patents were confined to the citizens of the United States, and they were to be granted by the Secretary of State, subject to the revision of the Attorney-general. By the act of the 17th of April, 1800, the privilege of suing out a patent was extended to aliens of two years' residence in the United States, and the act of July 13, 1832, only required the alien to be a resident at the time of his application for a patent, and to have declared his intention, according to law, to become a citizen. By the act of July 4, 1836, all former laws on the subject were repealed, and the patent s stem was re-enacted with important improvements, embodying a new organization of the Office, and conferring upon it much more extensive powers than it had heretefore possessed. Under this act the establishment was organized essentially as it exists at this day, except that by subsequent acts the power of appeal was allowed from the decision of the Commissioner to either of the judges of the Circuit Court of the District of Columbia. The Patent Office occupied a part of the General Post-office building, which was destroyed by fire on the 15th of December, 1836. All its invaluable contents were lost by this sad accident; and by the act of 3d of March, 1837, Congress provided for the recording anew of patents and assignments of patents recorded prior to the date of the conflagration, and for issuing new patents for those destroyed. The officers of the Patent Office were also directed to procure duplicates of the most interesting models burned, at a cost not exceeding $100,000. The loss of the Patent Office, or rather of its contents, caused a deep sensation throughout the country, and universal regret was expressed on all hands at this untoward event. Even the ruthless Admiral Cockburn, who fired the Capitol and President's House, and other public edifices in this city, had spared the Patent Office, and yet accident, in a few hours, destroyed the labors of many men for many years, which even that modern barbarian feared to touch.

This sketch of the legislation of Congress on the subject of patents, familiar as it is to the professional man, may give to the general reader an idea of the early and continuous importance attached by the law-makers to this important branch of the government. Growing out of, and forming as it were an integral portion of, the patent system is what may be termed the patent law branch of our jurisprudence. The minds of the most eminent of our jurists, both on the bench and at the bar, have been taxed to their utmost by the intricacy and subtlety of the investigations of many cases which have arisen and been adjudicated upon under these laws. A legal writer justly terms the patent law branch of our jurisprudence "the metaphysics of the law." And so it must continue to be and to increase, because of the increasing spirit of improvement in agriculture and manufactures and machinery, both here and in Europe. The Patent Office is essentially and necessarily a national institution in every sense of the word, and will always remain so, inasmuch as it would be impracticable for the States separately to make provision for the effectual protection of the rights secured to inventors under the patent laws.

All parties concerned in patents, whether as inventors or users of the machines for which they are granted, are fully aware of the importance of the faithful execution and enforcement of the patent laws; and there is no class of cases tried in our courts in which the community generally take more interest.

In all countries, and in all ages, inventors or discoverers of any new agent or implement useful to man in his varied pursuits, have been considered as among the most valuable citizens of the State, and deserving of its encouragement and protection. Of late years this appreciation of such men seems greatly to have increased, both in the United States and in Europe. We trust that it will ever be so, and that worth and merit, in whatever walk of life it may develop itself, may always meet with recompense and reward.—*Constitution.*

STEAM PLOWING AGAIN.

The steam plow of Mr. John Fawkes of Lancaster, Pa., which met with the misfortune of having it cog wheels broken on its early trial at Oxford Park (as noticed by us in a former number), has been repaired and several very successful trials have been made with it, on the same ground on which it was formerly tested. A committee of the Pennsylvania State Society, consisting of A. O. Hiester, and C. K. Engle, witnessed the operations on the 21st ult., and have made a report on the subject, a copy of which has been sent to us. The following is a part of it:—

"The soil was in good condition, owing to the late rain, which rendered the experiment more satisfactory.

The engine, which is of 30 horse power, is adapted to either wood or coal, and when the latter is used, consumes about half a tun a day.

All doubts of its success were speedily removed. The plows, eight in number, which were suspended by chains in a frame attached to the rear of the machine, about eighteen inches above the ground, by means of a slight adjustment of a crank were dropped to their proper position for action; and at the sound of the whistle the plow moved forward in the most graceful manner, performing its work with ease, and to the admiration and perfect satisfaction of the most skeptical.

The soil was made to yield to the united action of the eight mold-boards, each turning a furrow slice of fourteen inches in width, and six inches in depth, moving at the rate of four miles an hour (or four acres an hour).

The experiment was made upon a tough timothy sod, which had not been plowed for some seven years previously.

Mr. Fawkes, to show its capacity for easy locomotion over uneven surfaces, propelled it rapidly over several gullies, one of which was fully eighteen inches in depth, while others were very abrupt, and did this without any apparent detriment to the machinery.

It may be proper to add, that Mr. Fawkes placed the machine entirely at the disposal of the committee, and subjected it to every test which they suggested.

One of the committee familiar with prairie plowing affirms that he has never seen level prairie turned as beautifully by horse power as the uneven timothy sod was by the steam plow."

It is the intention of Mr. Fawkes to compete for the large prize of $5,000 at the next Fair of the Illinois State Agricultural Society, and he is quite confident of success. A committee of the American Institute was also appointed to witness the late experiments of Fawkes' plow at Oxford Park, but we have not yet learned whether they have reported the result of their observations. We have been informed that a prize of $500 will be offered by the American Institute for the best steam plow that may be exhibited at their next fair in this city.

CULTURE OF TEA.

For a long period a very persevering effort was made by Dr. Junius Smith to naturalize the tea plant of China, in South Carolina, and we believe that he had achieved a certain degree of success at the time of his death, which took place a few years ago, but that event put an end to all further efforts. Our government, however, through the Patent Office, has taken the matter in hand, and the same course has been pursued with the tea plant, as was with the Chinese sugar cane, namely, quite a quantity of the tea plant has been obtained from China for general distribution. A great many applications having been made for parcels of this seed, the Commissioner of Patents has issued the following circular on the subject:—

"Owing to the delicate nature of the seeds after undergoing so long a voyage, it would not be advisable to place them at present, for experiment, in the hands of those unacquainted with their culture. Beside, it has been proved that this product can be successfully cultivated in various parts of the South, so far as the soil and climate are concerned; but this has been done on so limited a scale that the profits could not be determined, nor the culture extended, from the difficulty of obtaining a larger supply of the plants. Hence, it would seem to be advisable that the present importations should be grown in considerable quantities in those sections where it is known it it would mature, in order that more seeds can be procured, and the culture indefinitely increased. Still, it would be proper that experiments should be made on a limited scale in all parts of the Union where there would be a probability of success. No disposal will be made of the plants now growing at the propagating gardens before the convening of the next Congress, after which a feasible plan will be proposed for their distribution."

From this circular, we conclude that the successful cultivation of this plant in our country, is now in a fair way of being tested thoroughly, and, the result may be as favorable as the cultivation of *sorgho sucre*. Our tea costs us $5,757,000 annually; and yet it is said that we never see the best qualities. A friend of ours, who is well posted upon the subject, assures us that our best tea is insipid in comparison with the superior qualities used in China, and some which comes by the overland journey down to Russia. The finest sorts are very dear in price, some specimens costing no less than $15 per pound. It appears to us, that we have both the climate and soil to raise tea of all grades, from the *Souching* to the *Hong Kong* imperial specimens, we therefore hope that the present experiments undertaken for its cultivation may prove eminently successful.

SKELETON LEAVES OF PLANTS.

The leaves of plants in skeleton form are so strikingly beautiful, and so infinitely varied, that a collection of them, when skillfully dried, makes an interesting addition to the parlor cabinet and furnishes a very pleasing kind of in-doors diversion for ladies. The first thing to be considered is the right age of the leaves, for on this point the successful operation must depend. If the leaf is too young, the part desired to be preserved will not possess maturity and firmness sufficient to resist the operations of decay to which the softer parts are subjected. On the other hand, if it is too old, the cellular tissue will have become so consolidated that its separation from the woody fiber will not be accomplished without great difficulty. The proper season, therefore, will be when the leaves are full-grown and perfectly ripened, so that both the above hindrances may be avoided. This is to be regarded as a general principle, but admitting of many exceptions—for exquisite specimens are obtained from old structures, as holly leaves, &c. Put as many of the leaves as you please with seed vessels, &c., into a vessel with rain water, and let them remain without change until the mass becomes pulpy, when the outer skin and the other, or soft substance, can be easily removed by a painter's brush applied with a gentle hand. If it is found that any of the parts which it is wished to have removed still remain, the leaves must be returned to the vessel, when a little longer subjection to natural influences will effect the proposed end. The time necessary for the maceration of the different leaves is as follows:—apple and pear, about three weeks; mulberry, about two or three weeks. If a fine white color is desired, the specimens may be bleached in chloride of lime.

ENGRAVINGS OF MACHINERY.—The circulation of the SCIENTIFIC AMERICAN is now larger by several thousands than at any former period, and we believe it has more readers than the combined journals of its class now published in both hemispheres. All past attempts to rival it in this country have miserably failed, and it is only to its columns that the public are accustomed to look for reliable information about the progress of invention, mechanism and discovery. The engravings which grace its columns are prepared by the very best artists, under our personal supervision, and are acknowledged to be unequaled for effectiveness and quality. Inventors and manufacturers are invited to correspond with us with a view to having their inventions and business illustrated. The conditions we are able to offer cannot fail to meet the approval of all who wish to avail themselves of our circulation.

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LAKE SUPERIOR COPPER MINES.

A correspondent of the Toronto *Globe* gives a description of the copper mines of Lake Superior, from which we condense a few interesting extracts. As far back as 1770, a company was formed in England, composed of persons of rank and wealth, for working a mine at Pointe-aux-Pins, and some English miners came out in 1773 and penetrated 30 feet into the vein of copper; but they were very incapable of conducting affairs, and, after a years' experience, they returned, and the company dissolved.

It was not until 1845 that the copper deposits of Lake Superior again attracted that general attention which they deserved. Great discoveries were made about that time on the American shore, and it was generally understood that the veins were quite as rich on the Canadian side of the lakes. Parties in Montreal, Quebec, Toronto add Hamilton embarked in the business of exploring with extraordinary vigor. The Montreal Mining Company despatched one expedition of 80 persons, who "prospected" the shores of Lake Superior from end to end in a single summer. Very rich mineral was discovered in a variety of instances, and the company took up a large number of locations. The Montreal and Quebec Mining Companies began to open veins on a large scale. Numbers of workmen were sent up, with every description of expensive equipment. Everything needed was hauled over the portage at the Sault, and transferred to vessels on the other side. Wharves were built, storehouses erected, machinery of the best kind put in, everything being done on a scale of expenditure as if the profits of mining copper were much greater than of gold, and in as great a hurry as if the ore was about to take itself wings and fly away. Cornish miners were brought out at high wages, and their provisions cost enormous sums. The end was what might have been expected. Ore was got out, but it cost more than it could be sold for, and the works were abandoned as utterly unprofitable. The Quebec Mining Company sold off all their improvements, even to the buildings, and left their mines to be filled by the rains. The walls of a few ruined buildings only remain on Lake Superior to show where many hundreds of thousands of pounds of Canadian money were expended. The Montreal Company alone continued their efforts, but on the Lake Huron shore, which is much more easy of access than that of Lake Superior. They bought the location of another company, known as the "Bruce mines," and have continued to work it with varying fortunes ever since.

On what is called the American (United States) side, most of the copper which has been mined is pure metal, mechanically mixed with stone and earth. On the Canadian side, copper fused in quartz, commonly called ore, is found in very large deposits, of various degrees and richness. Pure copper is also found there, but, so far, not in large quantities. There are two mines of pure copper on the American side, which have proved wonderfully remunerative. The two are the "Minnesota" and the "Cliff." In them the copper is found in such immense masses that, though they are difficult to get out, they nevertheless afford an ample return for the outlay. On that tough, ductile substance, powder-blasting has no effect. It must be cut with the cold-chisel and hammer, and only large masses have hitherto repayed the labor put upon them. About two years ago the Montreal company leased half a mile of their location to a company called the "Wellington," composed of eight London merchants, principally engaged in the metal trade. They spent considerable sums in erecting works, and found ores of a much more valuable character than any previously worked on the location; the operations of this company have been exremely profitable. The consequence is that they are' extending their operations; they have recently opened new mines, and have discovered very valuable ore. Enterprises, which would have been thought absurd and chimerical in 1844, when miners first broke ground on these rocks, have now the appearance of sober reality; steamers run along the coast regularly, and other vessels are innumerable. The iron-mines of Marquette will furnish this season 100,000 tuns of freight downwards; and as they have very little to bring up, they take anything that is offered as ballast, at nominal rates, and coal has actually been delivered at the mines at a quarter of a dollar a tun from Cleveland. This extraordinary cheapness has led to the establishment of smelting works at the Bruce mines, which will have a great effect on mining there. In the early days a smelting-house was erected, but soon abandoned, because it was cheaper then to carry the dressed ore to England than to bring the coal to the ore. All that is changed, and a firm have commenced smelting in the old works. They will use up ores which have hitherto been cast aside as not worth exporting, and their works will open a new era in mining. The expensive machinery hitherto used will be no longer required, as handdressing will suffice to bring the ore into the proper state for smelting.

THE MILKY WAY.

The Milky Way forms the grandest feature of the firmament. It completely encircles the whole fabric of the skies, and sends its light down upon us, according to the best observations, from no less than 18,000,000 of suns. These are planted at various distances, too remote to be more than feebly understood; but their light, the medium of measurement, requires for its transit to our earth periods ranging from ten to a thousand years. Such is the sum of the great truths revealed to us by the two Herschels, who, with a zeal which no obstacle could daunt, have explored evey part of the prodigious circle. Sir William Herschel, after accomplishing his famous section, believed that he had gaged the Milky Way to its lowest depth, affirming that he could follow a cluster of stars with his telescope, constructed expressly for the investigation, as far back as would require 330,000 years for the transmission of its light. But, presumptuous as it may seem, we must be permitted to doubt this assertion, as the same telescope, in the same master-hand was not sufficiently powerful to resolve even the nebulæ in Orion. Nor must we forget that light, our only clue to those unsearchable regions, expands and decomposes in its progress, and coming from a point so remote, its radiant waves would be dispersed in space. Thus the reflection is forced upon us, that new clusters and systems, whose beaming light will never reach our earth, still throng beyond; and that, though it is permitted to man to behold the immensity, he shall never see the bounds, of the creation.—*Marvels of Science.*

ENGRAVING OF ROLLERS FOR CALICOS, &C.—A Providence correspondent of the Boston *Journal* states that a mechanical arrangement has been invented by Mr. Milton Whipple, and improved by Mr. Thomas Hope of Providence, by which the engraving of rollers used in printing calicos and delains can be accomplished "in one quarter the time formerly employed, and a great reduction of labor and expense. The surface of the copper rollers are covered with a third coat of asphaltum paint before being placed on the machine. The mechanism is so arranged that upon tracing an index figure, which only requires one person to attend upon the sketch or pattern to be engraved, it forms a connection with several diamond points placed above the roller, and causes them to move in the same manner with the index. They thus scratch the lines of the pattern through the thin covering of asphalt upon the copper surface. When completed, the rollers are placed in dilute acid, which etches into the copper, where the paint has been removed, and thus accomplishes the engraving."

CURE FOR SPRAINS.—In the Paris hospitals a treatment is practiced that is found most successful for a frequent accident, and which can be applied by the most inexperienced. If the ankle is sprained, for instance, let the operator hold the foot in his hands, with the thumbs meeting on the swollen part. These, having been previously greased, are pressed successively with increasing force on the injured and painful spot for about a quarter of an hour. This application being repeated several times, will, in the course of a day, enable the patient to walk when other means would have failed to relieve him.

THE ANVIL CHORUS.—A correspondent, writing from North East, Pa., says: "One evening, as I was passing along the street, I met a sturdy son of the anvil, whom I had persuaded to take your paper, with the promise that I would pay for it if he did not like it. I asked him if he wanted his money back. He replied: 'No: I have got my money back already, and the balance of the six months is a clear gain. I would not do without it for twice that sum.'" This is the true "Anvil Chorus," and we ask all the sturdy blacksmiths in the land to join in its melody.

STEAM FIRE-ENGINE CORRECTION

MESSRS. EDITORS:—Mr. J. K. Fisher's letter in your last number is a wanton attack upon us, calculated, so far as it is credited, to injure our reputation and business, for which injury we shall, at the earliest moment, seek appropriate redress.

Your paper of Nov. 28, 1858, containing a full description of the steam fire-engine *J. C. Cary*, the materials for which article were furnished by us, is a standing witness that we do not seek to withhold from Mr. Fisher such credit as is due to him, as the inventor of the steam-carriage arrangement employed by us in the *Cary*, and since in the *Storm* and the *Southwark* steam fire-engines. Of the execution of this plan, which we have worked out in all its details according to our own judgment, frequently in opposition to his, changing in nearly every point the proportions and dimensions originally assigned by him, and introducing new and important elements to adapt it to our special purpose, and carrying the whole through, as the inventor himself has never done, to complete and even triumphant success in practical operation, we claim the undivided credit; and we are persuaded that all who know or who hereafter may come to know what we have done, and what he has attempted, will regard his claim to "all but the boiler and pump" of our engines as simply preposterous.

In regard to the statement that we "have no right to build steam carriages on this plan, and have no right to use it for fire-engines other than the two built for New York," we denounce it as calumnious, and, as already intimated, shall hold its author to a strict account for it.

LEE & LARNED,
Steam Fire-engine Builders.

[NOTE.—We had no intention, at the time we published the communication from Mr. Fisher, of doing injustice to these gentlemen, who have labored perseveringly and under many disadvantages to perfect a steam fire-engine. Our motto is: "Honor to whom honor is due;" and although Mr. Fisher had, by his former course towards us, forfeited his right to claim courtesy in our columns, we nevertheless, as independent journalists, felt bound to admit his note advising the public of his claims to an invention which we had previously noticed without mention of his name. His statement, however, that Messrs. Lee & Larned have no right to use his invention, by reason of a forfeiture which he says they have incurred, touching as it does on business arrangements between private parties, in which the public have no immediate interest, might be deemed out of place in our columns. Having admitted it, it is now due to Messrs. Lee & Larned to state that we have carefully examined the written agreement made between themselves and Mr. Fisher, and it seems clear to us that they have a right to use his improvements in the construction of their steam fire-engines.—EDS.

COTTON FACTORY IN CANADA.—Manufacturing operations are rapidly traveling north, and we learn that Canada West has made a beginning in the manufacture of cotton goods. The *Globe*, of Toronto, states that there is a new mill near St. Catherines, on the Welland Canal, conducted by Messrs Nutly & Co., in which about 600 yards per day are now made by 18 looms, and that its prospects are flattering. This factory is quite small, but as it is a beginning for Canada, it is a sure sign of its progress.

THE COMFORTS OF A WOODEN LEG.—A young French soldier recently wrote to his mother from Castiglione:—"Dear mother, I am yet living and lively; but I am not quite complete. The surgeon of the regiment has cut off one of my legs. I have been used to having the leg by me, and the parting was cruel. Do not weep, dear mother, but rejoice, rather, for I will rejoin you now not to leave you again. I will always be, now, part of your little card party, thanks to the wooden leg."

The daily rations of each horse belonging to the Third-avenue Railroad Co., this city, is 16 pounds of hay and 14 pounds of fresh Indian corn meal. The hay is generally cut before it is fed out. Experience has proved that with this kind and about this amount of food a horse will do more work than with any other, at the same cost.

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EASTERN MANUFACTURES.

Although success has been the general attendant of our eastern manufactures, good fortune does not rest on all their enterprises. The sale of the well-known "Lawrence Machine-shop," at Lawrence, Mass., on the 21st ult., affords us a witness to the correctness of this statement. The property belonging to this company cost over $1,000,000; their debts amounted to $274,000. That which was sold comprised lot No. 1, described as follows:—

"The Lawrence machine-shop and about 447,776 feet of land, including the whole area of the yard, except the premises about the foundry, and all the buildings, except the foundry and appurtenances, viz.: the office, a substantial stone building; the machine-shop, of stone, 405 feet by 65 feet, four stories high; pattern-house, 329 by 34 feet, three stories high; forge-shop, 232 by 54 feet; boiler-shop, 225 by 36 feet; store-house, 172 by 50 feet, and other valuable buildings; two mill-powers, three turbine wheels, all the shafting and gearing, penstocks, &c., and the right in the reservoir on the hill."

The above was disposed of for $93,000, to James Dana, Mayor of Charlestown, Mass. The original cost was $137,000.

Lot No. 2, comprising the foundry and about 160,665 feet of land, and a front of 87 feet on Garden-street, together with all the flasks, tools and appurtenances of a first-class foundry, ready for immediate use, without water-rights, and which was left optional with the purchaser of No. 1 to take at $20,000, but declined, was sold to him for $14,500. The cost of this was $84,000.

Fifty brick dwelling-houses, of two stories each, with 110,000 feet of land, were sold separately, and realized $48,325. The agent's house was sold to its present occupant, J. C. Hoadly, for $6,000, and a frame boarding-house for $2,025. Excepting the house of the agent, all the property was secured by Mr. Dana, who, it is said, has bought it on speculation. When the Lawrence machine-shop was built, several years ago, it promised to be successful, the demand for all kinds of machines from the western States being then very great; but the increase of machine-shops and foundries in the West and South during the past few years have greatly affected its interests, and it has been obliged to succumb to this reflux tide of manufacture.

The Kennebec Dam property was sold at Augusta, Maine, 19th ult., for $9,500 above the incumbrances, which are $30,000. This property consists of a massive dam, with locks, made across the Kennebec, about half a mile above the village of Augusta, which, besides creating an immense water-power, improves the navigation of the river above. The length of the dam, exclusive of the stone abutments and lock, is 584 feet, and its hight 15 feet above ordinary high water mark, forming a pond of the average depth of 16 feet, and 16½ miles in extent. Its first cost was about $300,000, but subsequent expenditures have also been large.

The Lyman Mills, Holyoke, Mass, have netted $75,000 for the past six months, after making a generous allowance for contingencies.

In New Bedford, Mass., Messrs. Ryder, Kelley & Co. have just completed a building for their immediate use as a manufactory of paraphine candles. The works are to be operated by steam-power, and can make about 400 pounds of candles per day.

The leather-tannery of S. D. Northway, of Norfolk, Conn., which was erected last year, employs a capital of $25,000, and turns out 300 tanned hides every week.

The rate of taxation in Lawrence, Mass., is $7.20 on the $1,000. The following is the amount assessed on each corporation:—

Atlantic Cotton Mills	$10,368 00
Gas Company	720 90
Lawrence Duck Company	1,224 00
Lawrence Machine-shop	2,880 00
Lawrence Paper Company	324 00
Pacific Mills	11,520 00
Pemberton Mills	3,240 00
Washington Mills	9,360 00
Bay State Bank	100 80
Pemberton Bank	61 20
	$39,798 00

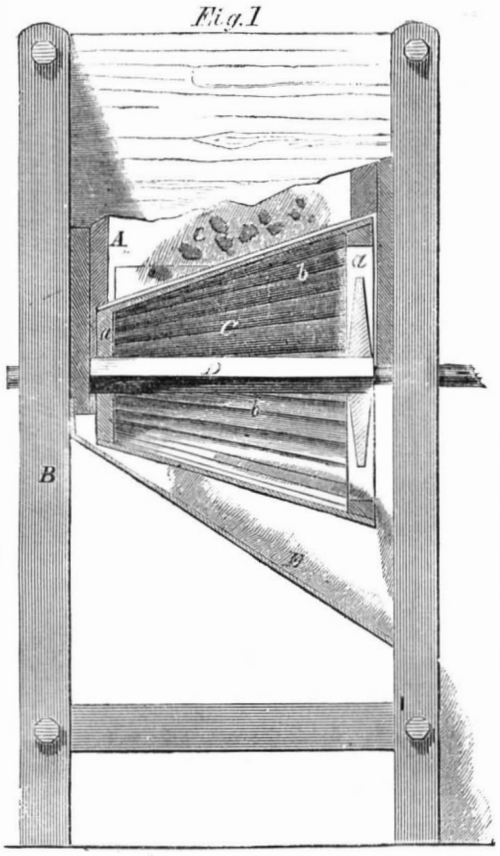
The whole sum raised by taxation in Lawrence is $73,677.

The *Commercial Bulletin* (Boston) states that there are 55 comb manufactories in Massachusetts, in which an aggregate capital of $271,060 is invested, and combs to the value of $557,422 made annually. Most of these combs are of horn, but they are being in a great measure superseded by those of india-rubber.

BAMBERG & BLASER'S CLAY-SEPARATOR.

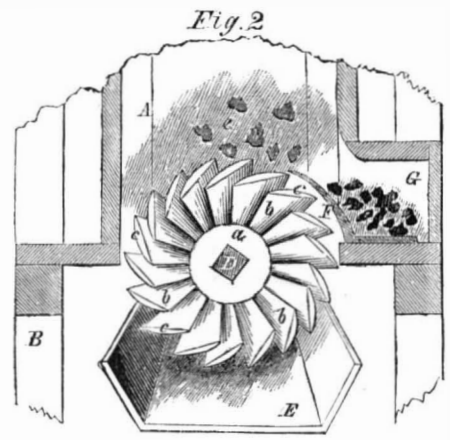
Clay, as generally found in nature, is a very different article from the same substance when transformed into articles of use or ornament. It its native bed it is impure, mixed with gravel, and occasionally large stones, which render it unfit for use until they have been extracted and the clay thoroughly cleaned from them; for, on account of the unequal expansion of stones and clay under the action of heat, any bricks or vessels made from stony clay would crack in the baking process, and become totally worthless. Our illustration shows a machine invented by Charles Bamberg and Roman Blaser, of Chicago, Ill., for cleaning clay and removing all the foreign substances. Fig. 1 is a vertical section of the

Fig. 1



whole machine, and Fig. 2 is a vertical section of the separating device at right angles to Fig. 1. The box, A, may be of wood, and is placed in a suitable frame, B, to elevate it to the proper hight. In the lower part of A, a conical screen, C, is placed, the screen being formed of two open heads, *a a*, one of which is larger than the other, and both are attached to a shaft, D, that has its bearings in B. To the peripheries of *a a*, a series of knives, *b*, are secured, which overlap one another, as seen in Fig. 2, and they are inclined or have a tangen-

Fig. 2



tial position, so as to leave spaces, *c*, for the clay to pass through. These knives should be of iron or steel, and should be attached at such a distance apart on the heads, *a a*, as not to allow large gravel-stones or other foreign substances of an improper size to pass through them. The shaft, D, can turn freely in its bearings, and below C a spout or trough, E, is placed.

F is a separator, which is placed in a box, G, attached to one side of the box, A. It is simply a metal blade, the upper edge of which is quite close to the periphery of the screen, C, and extends its whole length. The outer end of G is provided with a slide to close or open the box.

The machine is operated in the following manner: The conical screen, C, is rotated by any proper means, and the clay, *e*, is thrown into the box, A. The knives, *b*, as the screen rotates, divide or catch the clay which passes between them and the interior of the screen, and again through the screen into the trough, F, by which it is conveyed away to a suitable repository. All the large stones, gravel and foreign substances that cannot pass between the knives, *b*, are separated from the periphery of the screen by the separator or plate, F, and pass into the box, G, which may be emptied of its contents from time to time, as occasion may require.

The patent is dated May 10, 1859, and the inventors will be happy to furnish any further information upon being addressed as above.

DISCOVERY OF THE COMPOSITION OF WATER.

There has been a long dispute between the friends of James Watt and those of Cavendish, the chemist, as to which of them first discovered the composition of water, but the dates produced have always been in favor of the former. Quite recently, Mr. Bennett, of the British Museum, addressed a letter to Sir Benjamin Brodie, in regard to the French work of De Luc, in the library of the institution, which he had read, that proved priority on the part of Cavendish. This may appear to be a small matter to most persons, but a scientific discovery is such a grand and noble achievement that philosophers contend earnestly for such fame; hence the biographer (Mr. Muir) of Watt has addressed a letter in answer to Mr. Bennett, which proves that the latter did not understand what he had read, and that the work of De Luc is favorable to the claims of the great mechanic rather than to those of the great chemist.

To Clear a Room of Mosquitoes.—A writer in a South Carolina paper says:—"I have tried the following and find it works like a charm. Take of gum camphor, a piece about one-third the size of an egg, and evaporate it by placing it in a tin vessel and holding it over a lamp or candle, taking care that it does not ignite. The smoke will soon fill the room, and expel the mosquitoes. One night, I was terribly annoyed by them, when I thought of and tried the above, after which I never saw nor heard them that night, and the next morning there was not one to be found in the room, though the window had been left open all night."

Cleaning Silk.—The following is said to be an excellent recipe for cleaning silks:—Pare three Irish potatoes into thin slices and wash them well. Pour on them a half pint of boiling water, and let it stand till cold; strain the water and add to it an equal quantity of alcohol. Sponge the silk on the right side, and when half dry, iron it on the wrong side. The most delicate-colored silk may be cleaned by this process, which is equally applicable to cloth, velvet or crape.

To Imitate Rosewood.—Take half a pound of red sanders and the same weight of logwood and boil them in one gallon of water for one hour, then strain the liquor through a cloth and add half an ounce of alum, in powder, and stir until it is dissolved. This stain is now to be applied hot to the wood with a sponge, and it makes the reddish tinge of rosewood. When dry, the dark stain for the blackish streaks is made with a liquid obtained by boiling one pound of logwood for an hour in the same quantity of water as the above, and using it in the same manner. The dark stain can be made jet-black by adding a quarter of an ounce of copperas to the pure logwood stain.

Insects must lead a truly jovial life. Think what it must be to lodge in a lily. Imagine a palace of ivory or pearl, with columns of silver and capitals of gold, all exhaling such a perfume as never arose from human censer. Fancy again, the fun of tucking yourself up for the night in the folds of a rose, rocked to sleep by the gentle sighs of a summer's air, and nothing to do when you awake but to wash yourself in a dew-drop and fall to and eat your bed-clothes.

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NOVEL EXPERIMENT AT THE WASHINGTON MONUMENT.

Pigeons have often been put to practical uses before the present time; but the following account (copied from the Washington *Star*) of a novel and successful experiment in which a pigeon efficiently acted as a builder's assistant, and contributed its share towards the erection of the column designed to commemorate the greatness and goodness of the "Father of his Country," cannot fail to interest our readers:—"We mentioned a few days ago that Lieut. Ives, the superintendent of the Washington Monument, was desirous of arranging the machinery and rigging on the top of the column in order to an early beginning of the work. All the means of reaching the top had been removed except a single rope attached to a strong brace extending across the top of the column. At first it was suggested that a rigger might ascend by this rope, but Lieut. Ives, in view of the possibility of an accident by the undertaking, the rope being rotten, abandoned the plan. Since then several experiments have been made. First, a man was procured who, standing upon the ground outside the column threw a stone over it, more than 170 feet in hight. Having ascertained that he could perform this feat, a small pack-thread was attached to the stone, but the resistance of the air to the thread prevented his casting the stone more than half the hight of the column. Next an Indian bow and arrows were obtained from the Smithsonian Institute. The arrows alone were fired over the column easily, but when the experiment was made with the pack-thread attached, they could hardly be forced up a hundred feet. A rifle was next obtained, and the experiments were made inside the column by shooting the ramrod, with a pack-thread attached, upwards, in the hope that it would descend on the opposite side of the brace before-mentioned; but this plan also failed, the ramrod sometimes meeting with obstacles which prevented its taking the direction wished, and at other times the thread would be burned off by the firing of the gun. Yesterday a pigeon was obtained and carried inside the column. A pack-thread was tied to its leg, and the bird was carried to the top of a ladder by one of the gentlemen present and thrown upward; the company below, to frighten the bird and make it continue its flight upward, whooped and shouted; the bird flew round the column and at last rested upon a recess designed for the reception of one of the stones presented by contributors. By again whooping and shouting the bird was started and took its flight upward, and rested on the very brace over which it was desired to cast the thread. This was an anxious moment for those below. If the bird descended by the side upon which it rested, the plan would fail for the time; if by the opposite side, all was safe. The shouting and whooping were raised again, but the bird looked down upon the noisy company below with a quizzical "no you don't." A pistol was then fired to frighten him, and after some moments of suspense, the bird descended upon the side of the column desired. The pack thread was caught, a heavier cord was attached and drawn up, then a heavier and stronger cord, until a rope of sufficient size was secured over the brace to enable the riggers to proceed with safety to the work of refitting the rigging to the top of the column, and putting the machinery in complete order for future operations. The experiments were made under the direction of Lieut. Ives."

We may add that the method generally adopted by builders to get a rope over the roof of a high structure, when otherwise inaccessible, is to attach a string to a kite and so fly it over, letting the kite descend on the opposite side; then by attaching a rope to the string the former can be hauled over. In the case in question, however, this method was obviously impracticable within the hollow shaft of the monument.

LOW WATER INDICATOR.

Messrs. Editors:—I notice in No. 4, Vol. I., New Series, of the Scientific American, a sketch of an article called a "Low Water Indicator," accompanied by a description of the same, and purporting to be the invention of Messrs. Hoard and Wiggin, of Providence, R. I. As the article mentioned is almost identical with one which has been in use for several years, the patent for which belongs to me, and which is known as the "Low Water Detector," you will at once perceive that Messrs. H. & W. have adopted the entire arrangement of my apparatus in the construction of theirs. In order that you may comprehend the matter fully, I give you a copy of my claim as briefly given in the Patent Office Report of 1854, on page 255. You will thereby see that there is no possible way in which to use a "fusible disk" outside of a steam boiler for the purpose mentioned, without violating that claim.

The claim is to placing in a pipe, which is connected with a steam boiler, a fusible plug or disk, said plug or disk, L, being so far removed from said boiler but so connected with the water therein, that, when the water is sufficiently high, the plug or disk will be in contact or so surrounded with water cooler than that in the boiler as to prevent the plug from being fused; but when the water in the boiler shall fall below a proper hight, the steam will enter and come in contact with said plug and so surround it as to cause it to melt.

Will you have the kindness to insert the foregoing in your next number, in connection with the cut and description of the "detector," that the public may thereby receive information in regard to an article which infringes upon the claims of another.

E. H. Ashcroft.

Boston, July 26, 1859.

[The accompanying engraving is copied by us from Mr. Ashcroft's circular to show the construction of his invention. In Fig. 1, E is an air-chamber, C a chamber

Fig. 1

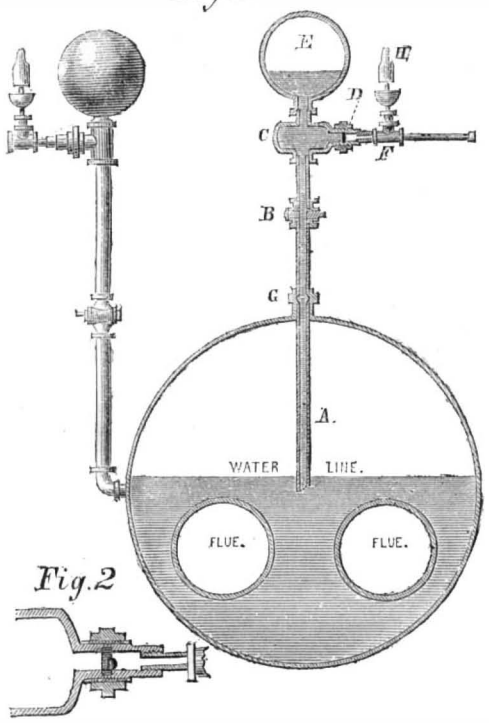

Fig. 2

furnished with a union joint, in which D, a disk of fusible alloy, is secured and made to close the opening, F; B is a cock, and G a coupling by which the tube, A, is attached to the boiler; H is an alarm whistle. In Fig. 2, which is the fusible plug enlarged, the plug, D, is alluded to as L in the claim.—Eds.

IRRIGATION, SUCTION AND FORCE PUMPS.

Messrs. Editors:—I should like to know if there are any scientific difficulties in the way of perfecting the following plan I have in view for watering my grounds in dry weather. I am laying out about 20 acres as orchard and market gardens, and on my land there is rather a deficiency of water, our only supply for household purposes being from a pump sunk 31 feet; but the supply from that is insufficient for watering so large a surface. In this state of things I purpose drawing from a running stream about half a mile off, the declivity to which is nearly 30 feet. I intend to excavate a cistern capable of containing a good supply, in the center of my grounds; laying a pipe to the stream, with a powerful suction pump, to be worked by a steam-engine. From this cistern distributing pipes are to be carried over the lands; hydrants are to be placed at intervals, on which a gutta-percha hose can be fixed, and the whole or any particular portion of the garden well watered at pleasure by the same engine.

I wish to ascertain, first, whether there is any obstacle in the way of drawing water this distance? I know the distribution is accomplished over much greater surfaces in England. And secondly, the proper size and material of which the pipes should be made—iron or wood?

S—.

Canada West, July 19, 1859.

[We think the enterprise of our correspondent, as a gardener, in designing to irrigate his grounds by drawing water with a steam pump, deserves great praise, and his example, we think, may be profitably followed by many others. It is our opinion that wooden pipes would be cheaper in Canada West than those made of iron, but we do not know their respective prices. We would use small way-pipes of two inches bore, and main pipes from six to eight inches. Our correspondent interrogates us, as we understand him, rather as to the practicability of the plan than the payability of it, as he is the best judge of the latter in his own neighborhood. We assure him it is perfectly practicable, and is a common method of supplying cities with water for public purposes; but the water can only be lifted by his pump to a hight of about 29 or 30 feet.—Eds.

TEST PAPERS FOR CHEMISTS.

Messrs. Editors:—In a recent number of the *Druggists' Circular*, Prof. Aikin, of Maryland, proposed a new test paper for alkalies and acids—namely, paper tinged with flowers of the hollyhock. If Prof. Aikin will consult the *Prussian Pharmacopœia*, he will find described the superior test paper of Prof. Fresinius. This is of a beautiful violet-color, and is most sensitive for testing alkalies and acids. When dipped into the former, it becomes a beautiful green color; when dipped into an acid, it becomes a bright red. It is very sensitive. In the work of Fresinius, the test paper is stated to be colored with the *georgina purpurea*, which may not be understood by most persons, but it is simply the botanical name of the crimson-colored dahlia. Now is the time to prepare for collecting these flowers by all who manufacture chemists' test paper. The common paper used for this purpose is colored with red cabbage; its tint is not so sensitive as that of the dahlia.

A. T. M.

Fishkill Landing, N. Y., August, 1859.

DEFIANCE TO THE ELEMENTS.

The beauty of the Palace of Westminster is ensured against untimely decay by two discoveries of a Polish gentleman, M. Szerelmey, now in process of general application to the building with most satisfactory results. One renders stone unabsorbent of moisture—the principal cause of decomposition from atmospheric action. It fills the interstices of the stone to which it is applied with a flinty substance, resists the action of the strongest acids, is unaffected by extremes of temperature, does not alter the granulated appearance of the stone, prevents decay and discoloration, is applied by a brush as easily and rapidly as any paint, and costs only one shilling per square yard. Some part of the Palace has been coated with it for upwards of two years, yet it is as clean and flinty as on the first day. Long-continued scrubbing with wire-brushes and water makes no impression on it. The other, termed granite composition, preserves iron from rust. The roofs of the Clock and Victoria Towers, to which it has been applied, are bright and clean as when emerging from the foundry. It adheres to a metal surface so tenaciously, that in attempting to remove it the chisel chips off the iron with it. It appears indestructible by the elements, and is uninjured by long immersion in sulphuric acid.—*Cassell's Paper*,

[We understand that the solution referred to is the silicate of soda, which is washed with dilute muriatic acid after it becomes dry, to render it soluble.—Eds.

How to Make Ivory Soft and Ductile.—According to the process of Geisler, in Switzerland, articles of ivory are placed in a solution of phosphoric acid of 1·130 specific gravity, and left there until they assume a transparent aspect. After this, they are taken from the acid, washed off in water, and dried with soft linen cloth. The articles are now as soft as thick leather; they become hard in the open air, and when placed in warm water they assume their former softness.

The application of such ivory for nipples of nursing-bottles, or for covers of sore breasts, and for similar articles, is of importance. The charge evidently consists in a solution of a portion of the lime, producing a composition containing a smaller per centage of lime than ivory.—*Dingler's Polyglot Journal.*

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TIN---ITS USES AND COMMERCE.

There are thousands of persons who have no further knowledge of tin than that of beholding it in the form of common pails and pans. Well, to use an expressive Irishism, "such tin is no tin at all." It is simply thin plates of iron coated with thin metal, the proper name of which ought to be *tinned sheet-iron*. Tin is one of our most useful metals, because it is employed for a great number of purposes. We propose to give some information respecting it, which will be new to most of our people, and interesting, we think, to all.

Tin is one of the most ancient metals—that is, it was well-known to the ancients; and it is very well established as a fact that the Phœnicians, those olden masters of the sea when Tyre was in her glory, made voyages to Cornwall, and obtained tin from the mines in that district, long before Britannia was known to the Romans. It was this tin, alloyed with copper, which formed the old bronze armor of the Asiatic warriors; and it may have been furnished also by the renowned Hiram, King of Tyre, the great architect and friend of Solomon, for the building of the first and unapproached Jewish temple. In appearance, this metal resembles silver when first polished; but it sooner becomes dim, because a thin coat of oxyd forms early on its surface when exposed to a moist atmosphere. It is quite ductile, and may be rolled out into very thin sheets, called *tin-foil*. When undergoing this rolling operation, it is kept at a temperature of about 212° Fah., at which heat its malleability is greatly increased. A common method of making tin-foil is to form ingots of lead and tin—the former in the heart of the ingot, the latter on the outside—and to roll these out into foil. By this process, the tin is retained on the outside, however thin the ingots may be rolled out, while the poisonous lead is kept inside; and by this means the cost of the material is not one-half what it otherwise would be if made entirely of pure tin. A patent has been secured for this invention, and by the reduction caused by it in the price of foil, the latter is now employed for a hundred purposes, such as wrappers for tobacco, labels on bottles, &c., for which paper and other substances were formerly used.

Tin is also extensively employed in the chemical arts, such as by calico-printers and dyers, for making what are called "spirit mordants" and "stannate salts." It is this metal which gives its brilliant hues to the rich crimson shawl and the azure-blue robe of the fashionable lady; and it forms the basis of many other colors on silk, cotton and woolen fabrics. For this purpose, the metal is commonly dissolved in an acid, such as hydrochloric or nitro-muriatic, which, in a diluted state, forms the chemists' "spirits." Instead of dissolving it as an acid for such purpose, as was exclusively done in former years, it is now combined with an alkali, and forms the stannate of soda, a salt resembling pearl-ash. In this form it is now extensively employed in Europe, and the writer of this has had some of it in his possession for more than a year, but has endeavored in vain to make some of our practical chemists appreciate its advantages. Tin dissolves in some acids like white sugar in hot water; but the action which takes place in the former case is chemical—in the latter, merely mechanical.

The tinned-plates employed by our "whitesmiths" for making milk-pans, pails, and such like articles, are all imported from England, to which country their manufacture is confined. We also import great quantities of this metal in pigs, called "block-tin." It is principally used for making bronze alloys for machinery and "white metal," formerly called "Britannia metal," which is an alloy composed of tin, copper and antimony. Very small portions of the latter two metals are used in the alloy—only a sufficient quantity to render the tin hard, and at the same time retain its ductile quality. A very great amount of this metallic alloy is employed in the manufacture of tea-table ware. It is first made into sheets; these are afterwards spun in lathes into the forms of tea, coffee and milk-pots, cups, flagons, and urns, of tasteful designs; after which they are electro-plated with silver, and become beautiful in appearance. Twenty years ago all our pewter and Britannia ware was imported from England; now, very little, if any, comes to us from abroad. We manufacture all we use at home. Skillful English artisans introduced the art among us, and there are very large manufactories for making this ware in Waterbury and Meriden, Conn., Taunton, Mass., and several other New England towns. Very great advances have been made of recent years in the designs or forms of articles formed of this ware. The old pewter tea-pots and their adjuncts were models of ugliness in comparison with the same class of articles now manufactured. The adoption of classic models has wonderfully improved the tastes of our people, and such has been the progress recently made in this art that elegant articles of such ware, with surfaces of dazzling pure silver, can now be purchased lower than the old pewter-pots, 30 years ago. At some other period, we may refer at further length to these manufactures; we must now, however, confine ourselves to tin as an article of commerce.

Four classes of tin find their way into our market. These are denominated *Banca*, *Straits*, *English* and *Spanish*. The first is the best, and is the principal sort which we employ. Our rocks yield an abundance of gold, but not a pound of American tin has ever been sold in our marts. Traces of this metal have been found at Lyme, N. H., Gotham, Mass., and in some parts of Virginia; but we have no tin mines.

"Banca tin," the price of which appears in our columns of the markets weekly, is always sold for about two and three cents more per pound than any other, because it is a reliable article, and its quality can be taken upon trust. The honest Hollander deserves credit for this confidence in the tin with which he furnishes us. Its name is derived from the island of Banca, where it is obtained, and which is under the government of the the Dutch East India Company. Great care is exercised in smelting the ore to obtain the metal pure and of a uniform quality, and the manner in which business is done in the selling of it is peculiar. The company makes public sales of this metal only once per annum, in the month of July, and accumulates the yearly products of their mines for this purpose. Rotterdam, in Holland, is the place of sale; and, about two or three months previous to this event, the company sends notices to all civilized countries of the amount to be sold, with the reliable guarantee that not another pound shall be furnished until July of the subsequent year. These annual sales were commenced about 20 years ago, and the promises of this Dutch company have always been sacredly kept, although, in many instances, great temptations have been presented by a high rise in the prices of the metal after the public sales. Those who purchase Banca tin at Rotterdam, do so with the perfect confidence that subsequently a flood of this metal cannot be poured into the market to lower their prices. The investment in it, therefore, is very safe, and the Rothschilds and other large bankers are frequent purchasers for the purpose of safely investing idle funds.

In 1856, there were 167,000 pigs of Banca (70 lbs. each) sold at Rotterdam; in 1857, 191,000; 1858, 191,000; 1859, 139,000, only. There was quite a falling off in the product last year, and, as a consequence, there has been a rise from two to three cents per pound in Banca since the news of the annual sales the last month arrived. Of the amount of this tin taken by the United States in four years, there were, in 1856, 32,316 pigs; in 1857 (year of the panic) 14,000; in 1858, 31,791; and this year, so far, 27,000 pigs. Our "white-ware" manufacturers do not find hard granules and other foreign substances in this tin, as they do in other brands; hence its high character for the most important purposes.

"Straits tin" derives its name from vessels which trade with ports in the Indian Archipelago, and pass through the Straits of Malacca. They collect this metal at Singapore, at Borneo, and other places; and, although some of the pigs are as good as those of Banca, on the whole it is not so reliable, but ranks next in value.

"English tin" is obtained in Cornwall, where the most productive mines of this metal in the world are located. The best qualities of English tin, it is said, never reach our markets; the poorer qualities only are exported. The "refined English," which is esteemed as good as Banca, and sells for the same price in London, is all kept for British manufacturing purposes, the demand for it being greater than the supply.

Our "Spanish tin" comes from Mexico and South America. Its quality is poor, owing to the slovenly method employed to smelt the ore. It could be refined to equal any other; but as it is, the pigs of it sold in our market are very impure.

This metal (tin) deserves more attention from our metallurgists than it has received, as its market value is steadily on the increase, and the demand for it advancing rapidly, because of its more general application to various new purposes in the arts. Banca tin is double the price it was 20 years ago; the wholesale price at present is 33 cents per pound, and the prospect is that it will attain to a much higher figure. Dr. Jackson, of Boston, who has discovered specimens of tin ore in New Hampshire, advises further prospecting for the metal, and we urge his suggestion upon metallurgists in every section of our country, as it costs us about $5,800,000 annually for it, the largest item being plates and sheets valued at $4,700,000, a sum which might be saved if we had tin mines of our own.

IMPROVED COAL OIL RETORT.

In the manufacture of oil from coal, the great object to be secured is the perfect regulation of the heat to which the coal is submitted. Thus, if the temperature is too high, a considerable portion of the volatile matter which is driven off becomes an uncondensable vapor, and is lost; if the heat is maintained at a lower degree, this can be condensed into oil. Another result of too high temperature is, that a considerable portion of the coal products also pass over in a thick, tarry state, mixed with oil. This causes increased expenditure for purification, by redistillation, and acids and alkalies, than it otherwise would if the temperature was maintained at a lower degree. We have been informed by Henry Alderton, of Smith-street, South Brooklyn, foreman of the coal works near Penny Bridge, that he has invented a retort in which the heat of the whole coal in it can be properly regulated, so that more oil may be obtained from it to a given quantity of coal, and that the oil is also purer than can be made by other retorts. At present, however, owing to unfortunate circumstances, he is not possessed of sufficient means to carry out his invention. One of these retorts can be examined by calling upon him, and judged upon its merits.

MAMMOTH LAWSUIT.—A correspondent, in referring to the notice of the great patent referee suit, published in our issue of the 4th of June, says the longest lawsuit ever heard of was between the heir of Sir Thomas Talbot and the heirs of Lord Berkley, in regard to certain possessions in the county of Gloucester, England. It began during the reign of Edward IV., and extended over a period of 120 years, when it was compromised. The case to which we referred has been in the hands of Chancellor Walworth for about four years, as referee. It is only within a few weeks past that the case for the defense was closed. The counsel for the plaintiff, Judge Foot, is now engaged in the testimony for Burden, and there is no knowing when it will come to an end. It is a libel upon all justice to allow cases to be thus protracted, and whoever is too blame for it should be held to a strict accountability at the bar of public opinion. We mean, if possible, to keep watch of this case, and may refer to it again.

FIRE CAUSED BY THE USE OF GLASS TILES.—In the duchy of Brunswick, Germany, a large fire was caused by some round, hollow glass plates, inserted into the roof of a steeple. The rays of the sun, being collected by the glass, caused the dry straw and hay on the upper story of the steeple to take fire, on the principle of burning-glasses. From this, it will be easily understood how much care must be taken in the use of such glasses, and they ought never be inserted in a roof except on the north or east side of the house.—*Dingler's Polyglot Journal*.

[This ought to be observed with particular care in this country, where the sun stands about 13° higher in the hot season, and his rays, therefore, have much more power.—EDS.

PORCINE PLOWS.—In Iowa they have such huge long-nosed hogs in portions of that State, that the settlers employ them to plow the fields. They bury a corn cob at one side of the field, and place a hog at the other side. The "porker" immediately digs his snout into the rich soil and turns a furrow equal to that of the best plow, right up to the cob. Some settlers say that if a stump should be in the way of the furrow, the hog splits it open with his snout.—*Exchange*.

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RAILROAD AXLES AND THE FORCES THEY HAVE TO RESIST

From a Prussian journal for architects and civil engineers, we take the following report on a series of experiments made by Superintendent Woehler, of one of the largest railroad lines in Prussia, with different axles and under different circumstances.

The forces which act on the axles may be divided into two classes, one class containing those forces which tend to effect a flexion or bending of the axle and the other containing those which effect a torsion or twisting of the same. Two simple and ingenious apparatuses were attached to the axles, which, by means of steel points acting against zinc plates, indicated after each trip the degree of flexion and the respective torsion of the axle.

With the experiments on the flexion of the axles, it was necessary to ascertain that force which, when applied to the circumference of the wheel, corresponds to the flexion indicated by the steel point of the apparatus on the dial plate. For this purpose two dynamometers are attached, one to each wheel and near to its circumference, and the two wheels are forced towards each other until the apparatus on the axle indicates the same degree of flexion which has been indicated by the steel point during the trip. It must, however, be remarked that the apparatus, as it revolves with the axles, causes the index to deflect in opposite directions, producing a deflection twice as large as that produced with equal power by means of the dynamometer. The apparatus was so constructed that, during the motion of the train, one inch deflection of the index was equal to a side motion of the circumference of the wheel of 3-16 of an inch, or to a deflection of 3-32 from its normal position. The side-draught, which has to be applied to the circumference of the wheel in order to produce the same flexion of the axle or a one-sided deflection of the index of a half inch, is equal to $23\frac{1}{2}$ cwt. for axles of $3\frac{3}{4}$ inches diameter in the hubs and for wheels of $36\frac{1}{4}$ inch diameter. For axles of 5 inches diameter in the hub and with wheels of $36\frac{3}{4}$ inches, the side-draught was found to be $70\frac{1}{2}$ cwt.

With the experiments on torsion the apparatus was so constructed that, with axles of $3\frac{1}{2}$ inches, one inch deflection of the index corresponds to a motion of 0·321 inches on the circumference of a wheel of $36\frac{1}{4}$ inches, which is also the double amount of the real reflection of each point of the circumference from its normal position. Each inch of deflection of the index, therefore, corresponds to an angle of torsion of 30 minutes. To produce this amount of torsion, a power equal to $18\frac{3}{4}$ cwt. had to be applied to the circumferenee of the wheel. With axles of five inches diameter the angle of torsion, corresponding to one inch deflection of the index, was found to be 21 minutes, which required a power of 44 cwt. applied on the circumference of the wheels of $36\frac{3}{4}$ inch diameter.

Experiments have been made with cars running on six and on four wheels, and the results were collected in tables giving the number of miles traveled over by the cars, the weight of the cars with their respective loads, and the largest deflection of the indexes of both the apparatuses for flexion and for torsion.

With axles of $3\frac{3}{4}$ inch diameter, made of cast-steel and running under cars with four wheels and with a weight of 117·6 cwt. on each axle, the largest deflection of the index by flexion was 3 1-16 inch, which is equal to a side-draught of 72 cwt. The tension of the extreme fibers of the axle in this case is equal to 252 cwt. per square inch, and the deflection of the wheel from its normal position is equal to 0·287 inches. The average deflection of the index, with covered cars running on four wheels, however, was found to be from $2\frac{1}{3}$ to 2 2-3 inches, requiring a side-draught of from 54 5-6 to 62 2-3 cwt.

The largest deflection of the apparatus for torsion, in in the same case, was found to be 1 7-12 inches, which is equal to a power of 29 11-16 cwt. on the circumference of the wheel, producing a tension of the extreme fibers equal to 52 cwt. per square inch. The average deflection in this case was 1 1-12 inch, which is equal to a power of $20\frac{1}{4}$ cwt. on the circumference of the wheels.

If the two largest forces on flexion and torsion act simultaneously, the extreme fibers of the axle sustain a power equal to the square root of 252^2+52^2 which leaves 257 cwt. per square inch. This shows that the torsion increases but very slightly the tension of the extreme fibers produced by the flexion of the axles.

Such a power would be amply sufficient to produce a considerable bend with wrought-iron axles, where the limit of elasticity is approached by a tension of the extreme fibers equal to 180 cwt. to the square inch.

With axles of five inches diameter and a load of 153·15 cwt. per axle, the largest deflection produced by flexion was 1 15-32 inches, which is equal to a deflection of the circumference of the wheel, from its normal position of 9-64 inches, and which requires a side-draught of 102 35-64 cwt. The tension of the extreme fibers in this case is equal to 156 cwt. per square inch.

The largest torsion was produced with a load of 164-25 cwt. per axle. The deflection of the index was equal to 1-16 inch, which requires a power of $46\frac{3}{4}$ cwt. on the circumference of the wheel, and the tension of the extreme fibers is equal to 35 cwt. per square inch.

If an axle is calculated to run 200,000 miles and the largest deflection takes place once in every 10 miles, it (the axle) will break if it cannot be bent 20,000 times to this deflection from its normal position. In order to ascertain, therefore, the largest load which an axle is able to carry with safety, it is necessary to ascertain how far and how often the axle can be bent.

Careful experiments made in this respect show that the maximum load of a five-inch wrought-iron axle ought not to exceed 155 cwt.; that of a $4\frac{1}{2}$-inch axle, 113 cwt.; that of a 4-inch axle, 79 cwt.; and that of a $3\frac{3}{4}$-inch axle, 70 cwt.

PENNSYLVANIA POLYTECHNIC COLLEGE.

The Sixth Annual Commencement of this institution was recently held in the college-edifice, Penn-square, Philadelphia. The thesis selected by the graduating class, to be read by its author at the Commencement, was that of Mr. George E. Ford, of Olney. The subject of this essay was: "The Structure of Timber; the Causes of its Decay, and the Principles involved in Processes for its Preservation." A description of these various processes were given, accompanied by practical illustrations of their value.

The Annual Address was delivered by Dr. A. L. Kennedy, President of the Faculty, who gave a rapid sketch of the recent progress of the arts of production and construction in the United States, and of the relation borne to those arts by the four technical schools which compose the Polytechnic College, namely, the School of Mines, and the scientific and practical training it affords in mine-engineering, and in the best method of determining the value of mineral lands, and of analyzing and manufacturing mine products; the School of Civil Engineering, in which are taught the most approved principles and methods involved in the construction of roads, bridges, buildings and public works, and in the application of propelling power; the School of Mechanical Engineering, with its courses on mechanical philosophy and the principles of machinery, the sources of mechanical power, the location and construction of furnaces, foundries, engines, &c.; and the School of Chemistry, in which are imparted the principles of the science, as well as practice in testing, in the examination and smelting of ores, analysis of minerals, soils, &c.

The degrees of the college were conferred by Matthew Newkirk, Esq., President of the Board of Trustees, on the following gentlemen:—

Degree of Bachelor of Civil Engineering.—Francis Z. Schellenberg, of Minersville, Pa.; subject of thesis—"Plan and description of a five-arch stone railroad bridge." Daniel Carhart, of Perryville, N. J.; subject of thesis—"Design for a suspension bridge, with specifications for the same." George E. Ford, of Olney, Pa.; subject of thesis—"The growth and preservation of timber."

Degree of Bachelor of Mine Engineering.—Graham Blandy, of Newark, Del.; subject of thesis—"The history, mineralogical occurrences, geological position, and uses of copper."

First-year-men, distinguished for Scholarship during the Year.—Charles G. Wilcox, of Philadelphia, Pa., and Frank T. Firth, of Germantown, Pa.

THE most elegant suite of rooms in the world is at the Hotel de Ville, in Paris. They form a circuit of about half a mile, and require for their complete illumination 9,714 tapers and 2,387 gas-burners. 7000 visitors can be accommodated at once, without discomfort, in these capacious rooms.

TRANSPLANTING LARGE TREES.

A Paris correspondent of the Boston *Transcript* gives some information on the above subject, regarding which several inquiries have recently been made of us. He states that the Champs Elysées is undergoing great improvements, and among the rest, trees two feet in diameter are being transplanted in it to take the place of old and decayed ones. He thus describes the operation:—"It is a strange sight to see a tree two feet (?) in diameter, in full foliage, moving up through the boulevard, on wheels. I have been astonished at the size of some of these trees that I have seen riding by me, and my curiosity led me about a mile out of the city to see the process of taking them out of the ground, which is as follows:—A circle is cut round the tree about three feet from the trunk, and at a depth of about five feet through roots and earth. The earth which adheres to the roots is covered and bound with brush and ropes to keep all together; then large chains are passed under the whole, and the ends brought up above the surface of the ground. It now being ready to be removed, two heavy strong planks are laid down outside of the holes to receive the wheels of the wagon, which is made of iron, and a skeleton body of only two side pieces, which connect the fore and aft wheels; the front wheels having an axletree passing from one side to the other, while the rear wheels are hung like those upon many railroad cars, having one open space, and strengthened by a heavy piece of iron, which can be removed at pleasure. Over each wheel is a windlass to hoist it by a crank. Now, being ready to take up the tree; the heavy cross-piece behind is removed and the vehicle is backed upon the planks, and the trunk of the tree now stands up through the middle of the wagon body; the ends of the chains are made fast to the windlass, and eight strong men, two at each crank, wind up the chains and swing the tree, roots and earth, to the wagon, put in the cross-piece behind, attach from four to six horses, and drive off. The tree is put into the ground in the same manner as it is taken out. In this way some of the avenues of Paris, which a month ago were exposed to the hot melting sun, are now converted into beautiful cool and shady walks, where one may sit at his ease under the refreshing influence of the soft, soothing breeze from the Seine, and admire the beautiful scenery surrounding him."

OLIVE OIL AS AN ANTIDOTE IN POISONING.

A new and excellent journal, *The Druggist*, published in Cincinnati, Ohio, states that a paragraph has been extensively circulated in the daily papers to the effect that olive oil is an antidote for all poisons. This is so far from being true, that it increases the effect of one very common poison—phosphorus—and has no power as an antidote to most of the others. There is no universal antidote, and in cases of poisoning, when the proper remedy is not known, the safest plan, in the absence of a competent physician, is to produce vomiting if it has not already come on, by some simple emetic, such as mustard and water, and then give mucilaginous drinks—such as milk, flour and water, &c.

Such paragraphs as the one alluded to are calculated to do much harm by leading persons to depend on a remedy which will do no good, to the exclusion of others really efficacious.

INK FROM ELDER.

We learn from Wittstein's *Vierteljahresschrift* that an excellent permanent black ink may be made from the common elder. The bruised berries are placed in an earthern vessel and kept in a warm place for three days and then pressed out and filtered. The filtered juice is of such an intense color that it takes 200 parts of water to reduce it to the shade of dark red wine. Add to $12\frac{1}{2}$ parts of this filtered juice, one ounce of sulphate of iron and the same quantity of pyroligneous acid, and an ink is prepared which, when first used, has the color of violet, but when dry is indigo blue black. This ink is superior in some respects to that prepared with galls. It does not become thick so soon; it flows easier from the pen without gumming; and in writing, the letters do not run into one another.

TO OBSCURE WINDOW PANES.—If one ounce of powdered gum tragacanth, in the white of six eggs, well beaten, be applied to a window, it will prevent the rays of the sun from penetrating.

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IMPROVED DOUBLE SEAMING MACHINE.

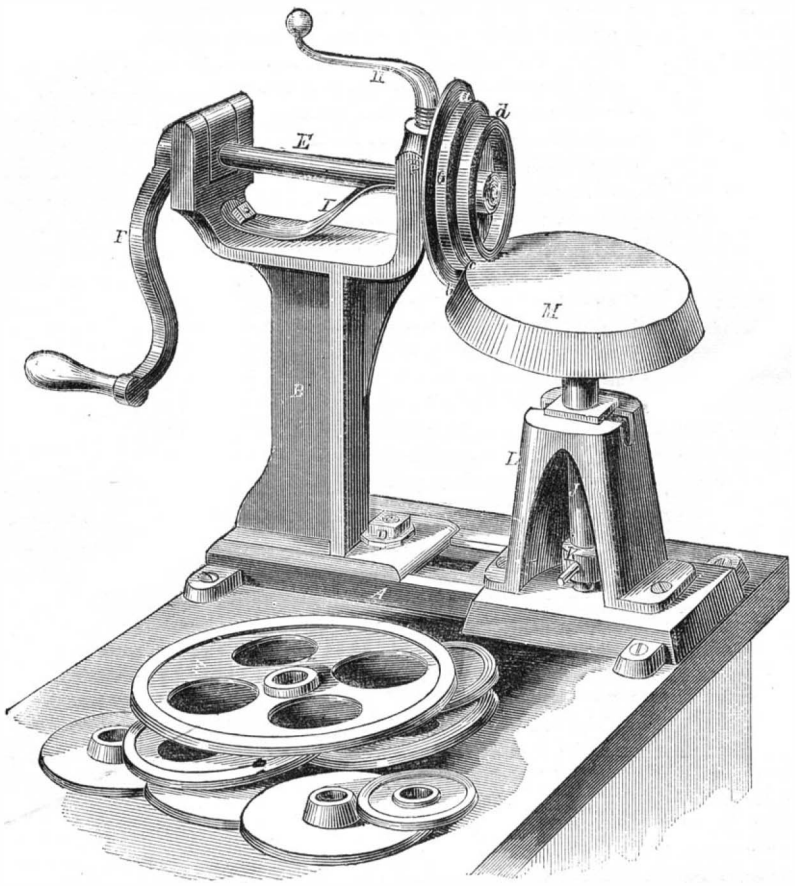
Double seaming is the operation of turning down the double seam on any tin vessel, as, after the bottom is sprung on, the seam has to be turned down. This is usually done by turning the pan upside down on a "stake" in the bench and setting the seam down with a mallet, which is a very slow and noisy operation and is liable to leave the bottom wrinkled, so that, in a milk pan, for instance, the wrinkles on the bottom soon wear and leave holes in the pan. With the subject of our illustration the bottom of the vessel is drawn on straight like a drum head, and there are no wrinkles.

A is the base on which the machine stands, and which may be fastened to a table or bench. B is an upright standard fastened to the base by a screw-bolt and nut, D, in such a manner as to be capable of being moved backwark and forward to accommodate large or small tinware. On the top of this standard a crank-shaft, E, is arranged so as to rotate. To one end of this shaft the crank F, is attached, and secured to the other is the working head, G. The working head is shaped at *a b* so as to operate on flaring tinware, and at *d c* to operate on straight work. H is a set screw to pitch G down upon the tin pan, and I is a spring for raising the shaft, E, and head, G, from off the work when done.

J is a vertical wrought-iron shaft that stands in an adjustable step, K, of a vertical standard, L, of the base, A. The upper part of this shaft is conical, and a taper disk or "former," M, goes on, so as to be readily removed when it is desired to substitute a disk with straight edge, or a different size for different works. Ten of these "formers" are supplied with each machine. Below the disk or "former" the shaft fits in a box which slides longitudinally in a groove of the standard, L, so as to allow the tin pan, while on the disk or "former," to be moved in and out under the working head. The step, K, of shaft, J, is made adjustable, the object of which is to raise the disk with taper side to a proper position for working in concert with the parts, *a b*, of the working head; and when a disk with a straight side is used it can be lowered to work in concert with the parts, *c d*, of the working head. One peculiar and very valuable feature of the machine is what the inventor calls the "oblique draft." The shaft, J, stands out of center, so that when the two heads are brought together the tendency is to "draw in" and feed itself perfectly. The manufacturers state that one man can do as much work with one of these machines in one day as fifteen men working by hand.

The inventor is William Burton, of Cazenovia, N. Y., and he obtained a patent June 21, 1859.

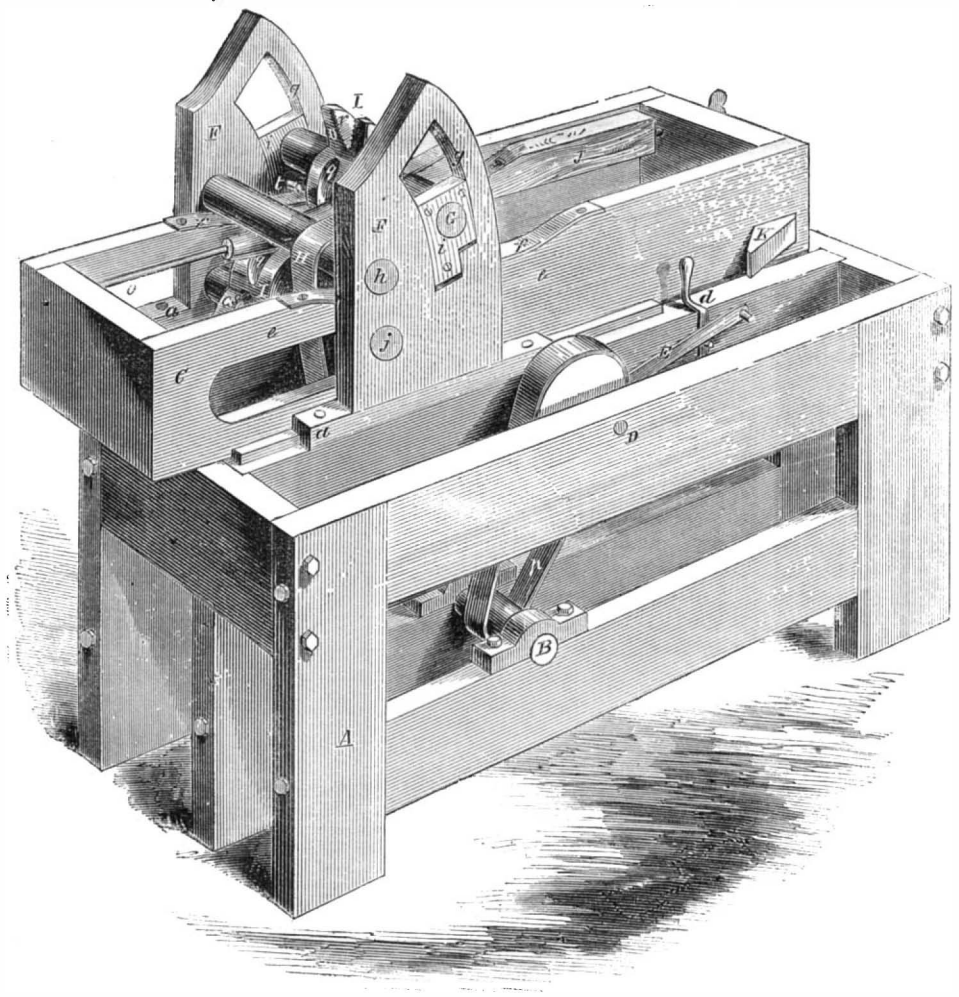
Any information concerning rights can be obtained from Messrs. Shaw & Clark, Biddeford, Maine, and N. E. James & Co., of No. 23 Cliff-street, New York City, who have the agency for the sale of machines.



BURTON'S DOUBLE SEAMING MACHINE.

IMPROVED PLOW-HANDLE CUTTER.

The subject of our engraving is the simple and excellent plow-handle cutter invented by G. W. Matthews, of York, Pa., and patented by him May 24, 1859.



MATTHEW'S PLOW- HANDLE CUTTER.

In our respective view A is the frame, in the lower part of which a driving shaft, B, is placed, and on the upper part a carriage, C, is fitted between suitable guides, *a*. The carriage has a rack attached to the bottom of one of its sides, *e*, and a pinion on the shaft, D, gears into the rack to give the carriage motion. The shaft, D, has its bearing in an adjustable arm, E, which is kept elevated and the pinion in gear with the rack, by a spring catch, *d*. The upper part of the sides, *e*, are curved at *f*, which curve has a shape corresponding to the profile of the handle to be cut. On the frame at each side of the carriage is a standard, F, permanently secured to it, and they are each provided with a curved slot or opening, *g*, which are parts of circles of which the shaft, *h*, is the center. In *g* there are bearings, *i*, which can slide freely in them, and they carry a shaft, G. Between F F a shaft, *j*, is fitted below the shaft, *h*. H is a belt that passes around a pulley on one end of shaft, B, and around pulleys on the shafts, *j h* G, by which arrangement they are all driven by the same belt. In each side of C there is an opening, *o*, so as not to allow the shaft, *j*, to interfere with the motion of the carriage. The shaft, D, is driven by a belt, *p*, from B.

On the two shafts, G *j*, cutter-heads, I I, one on each shaft. These cutters may be described as being of S-form, the shafts passing through their centers. Each cutter-head has a V-shaped groove, *q*, made in its periphery, which extends nearly to the center, and to each end of each cutter-head a cutter is attached. Each cutter-head is provided with two cutters, *r s*, the cutting edges of which conform to a transverse section of the groove, *q*, and corresponds to one half of a transverse section of the work cut by the machine, and each cutter, *r*, has serrated edges and the cutter, *s*, smooth edges. The stuff, J, is secured in the carriage by screws from each end. To one side of the carriage, C, at on end a projection, K, is attached, and to the inner side of each bearing, *i*, a pin, *t*, is secured.

The operation is as follows: The stuff is got out in proper form and placed in the carriage in the cutting plane of the cutting heads. Motion is given to the shaft, B, and I I rotated and the carriage moved along so as to carry the stuff between the cutters, the serrated edges of which rough off the stuff and the smooth ones finish it. As the carriage moves along the curves, *f*, passing under the pins, *t*, on *i*, and so cause the shaft, G, and its cutters, I, to rise and fall, cutting the handle the same profile as the convex themselves; the slots, *g*, allowing, from their shape, the shaft, G, to have this motion without altering the tension of the belt, H. Although this machine is called a plow-handle cutter, it can cut any similar articles equally as well, and it must be understood that only the top cutters are movable up and down, the lower ones being stationary. When the carriage, C, reaches the end of its movement the projection, K, comes in contact with the spring catch, *d*, and releases the arm, E, so that the pinion is allowed to drop out of gear with the rack, and the carriage can be drawn back, the finished work removed, and another piece of stuff inserted to undergo the same operation.

The inventor will be happy to give any further information upon being addressed as above.

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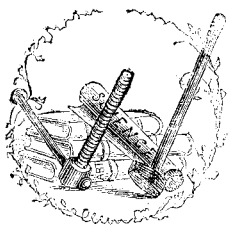
VOL. I., No. 6.....[NEW SERIES.].....*Fifteenth Year.*

NEW YORK, SATURDAY, AUGUST 6, 1859.

THE FATHERS OF PHILOSOPHY.—VI.



WHETHER science had done much for mankind, or the useful arts were practiced to a large extent at that period of the world's history in which our Fathers of Philosophy lived, is an important question; and we may here endeavor to give a brief idea of what had really been accomplished by pre-Christian genius and ingenuity. The patriarch Lamech was the father of the useful arts, since one of his sons, Jubal, first built tents to shield his poor fellow-beings from summer's heat and winter's cold; Jabal solaced the afflicted, and gave enjoyment to the otherwise weary hours by playing on the harp and organ, which latter, we may suppose, was a collection of hollow reeds; Tubal Cain first worked in metals, and, as the song says, "he fashioned the first plow-share;" and Lamech's daughter Naahmah gave employment to the women by inventing or introducing spinning and weaving among the early nomadic antediluvians. This was about 3,300 years B. C. The next landmark in useful history is found in China, where, in 1,998 B. C., Ching Hong taught the Chinese the art of tilling the ground and improving land by cultivation, of making bread from wheat and wine from rice. Passing now over an immense space of time, in which the wedge, the ax, and lever had been added to our mechanical appliances, we come to 477 B. C., when Simonides of Cos obtained a prize at Olympia for a system of mnemonics or artificial memory, which he had invented, thus showing that they were then fully aware of the importance of preserving their history and knowledge. Shortly after, in 460 B. C., the Carthaginians sailed to Britain for tin, and in 441 B. C. the battering ram was invented by Artemones. Yet, with all the knowledge, so little had the world profited by Thales' explanation and prediction of an eclipse, that in 414 B. C. the Athenians, while fighting at Syracuse, were defeated by an eclipse of the sun. It was in this latter epoch that Ezra, Nehemiah and Malachi prophesied in Judea, and in Greece tragedy and comedy were making great advances, the latter under Aristophanes, and the former under Euripides. Having thus presented a condensed view of knowledge and the useful arts, let us pass to our real subject, the philosopher—

ANAXAGORAS.

He was born at Clazomene, in Ionia, 500 B. C., and early left his native country to reside at Athens. Cicero says of him, "he devoted himself wholly to the divine pleasure of learning and inquiry." From Athens he went to Miletus, and listened to the closing instruction of Anaximenes, and returned back at 20 years of age to his adopted city, where for 30 years he taught philosophy, and numbered among his pupils Euripides, before-mentioned, and Pericles, the orator and statesman. Gradually his success excited envy, for he taught doctrines much opposed to the vulgar errors and superstition; he deprived the gods of much of their divinity, and as a consequence was thrown into prison and condemned to death. When told his sentence he remarked, "Nature long ago pronounced the same sentence against me;" and when condoled with by one of his friends, he replied, with an amount of fortitude and vanity, "It is not I who have lost the Athenians, but the Athenians who have lost me." Pericles, with much difficulty, at last got the sentence commuted to a fine and banishment. He then retired to Lampsacus, where he devoted his time to the instruction of youth; there he died, beloved by all, 428 B. C. Above all the meaner motives of mankind, and scarcely touched with ordinary passions, he lived a true philosopher, and sought with convincing earnestness to diffuse the doctrines he held. When the news of the death of one of his sons was brought to him while lecturing, he calmly observed, "I knew that I begat him mortal;" and when pressed to choose a place of interment, he said, "The way to the grave is everywhere open." He requested that the day of his death might be commemorated by a public holiday, which was strictly observed. A tomb was erected over him, and an epitaph of the following tenor engraven thereon:

"This tomb great Anaxagoras confines,
Whose mind explored the paths of heavenly truth."

He thought that the heavens were a solid vault in which luminous bodies were fixed; these were solid, and had been raised from the earth by the swift movement of the circumambient ether, set on fire by its heat, and kept in place by the rapid motion of the heavens. To set off this he taught that the winds were produced by the rarefaction of the air, and that the rainbow was produced by the solar rays; and also that the moon was a solid body illuminated by the sun, and divided into hills and valleys, land and water. He discovered that comets were wandering stars, and that the fixed stars were in a separate region, far distant from the sun and moon. An absurd notion to us, but one which showed in him much thought and ingenuity, was an atomic idea, that all substances were composed of atoms of the same material, or, as the poet has expressed it:

"With Anaxagoras great nature's law
Is similarity; and every compound form
Consists of parts minute, each like the whole;
And bone is made of bone, and flesh of flesh;
And blood, and fire, and earth, and massy gold,
Are, in their smallest portions, still the same."

This idea modern chemistry has completely exploded, but it is creditable to the author, as he taught it to meet certain objections to the atomic notion which the more learned priests were advancing.

His morals were excellent, as he opens his work with this sentence: "All things were confused, then came mind and disposed them in order." He was the first of the philosophers who had conceived mind as distinct from matter, and believed that the mind or ethereal part was supreme, and, supreme of that supremacy, the highest form of mind, in form and action, was the true divinity—GOD!

A DISPUTED QUESTION IN STEAM EXPLOSIONS.

A new hypothesis has been advanced within a few years, regarding the cause of boiler explosions; and it seems to find considerable favor with many persons. It consists in attributing these disasters to electrical discharges in boilers. There are individuals who prefer mysterious, undefinable explanations of common things to simple, lucid and reliable information, and this, we conclude, is the case with many persons in regard to boiler explosions. We thus judge from the number of articles which have been lately published in various papers—each an echo of the other—on this subject.

We have taken the position that an excess of steam pressure, in proportion to the strength of boilers, was the cause of explosions. This theory embraces overheating of the metal, flaws in the plates, and other defects. It is simple and tangible, without mystery, and is capable of proof. Some writers have asserted that the mere pressure of steam generated in a boiler could not produce such powerful explosions as have sometimes taken place; that some other agent must have been the cause of the disaster, and this agent (because a mysterious one) they assert, must be electricity. We noticed this subject a few weeks since, in answer to articles in some of our city and Philadelphia dailies, and pointed out the incorrectness of the conclusions which our cotemporaries had advanced. We would not now recur to the subject, were it not that articles have recently appeared on the same topic in the *Railroad Record* and *Railroad Times*, and because an explosion occurred on the 23d ult., at Worcester, Mass., which affords conclusive proof as to the dreadful power of compressed steam. On the day referred to, a boiler 30 feet long, four feet in diameter, and weighing five tuns, belonging to the wire factory of Washburn & Co., exploded with such violence that it shot through the engine-house walls into the air, to an altitude of 200 feet (as estimated by many observers), then came down in the garden of J. M. C. Armsby, over a quarter of a mile distant, and driving itself into the earth to the depth of four feet, thence rebounded from the garden, and, breaking off a portion of its top or rim, which it left buried there, it finally expended its force by landing itself on the other side of the street, where it lay extending diagonally across.

The cause of the catastrophe is explained by the proprietors of the establishment as follows: "While some of the men were at work hoisting up the wire, the rope became entangled in shafting, rendering a stoppage of the engine necessary, with a closing of the safety-valve. The consequence was an increased pressure of the steam, which caused the explosion."

No person was killed by the explosion, but the destructive force exhibited was as great as in some cases in which hundreds of lives have been lost. We are afraid that the electrical theory of explosions may lead the minds of persons away from the true source of the evil, and thus produce carelessness or indifference in taking care of boilers. Those parties who have advocated the electrical theory urge the use of conductors to carry *plus* electricity from the boilers; and to this we do not object, because, if they do no good, they cannot possibly do any harm. But electricity, *per se*, cannot cause an explosion of a boiler, as a disruptive discharge striking a boiler would do no injury, but it would be conducted away by the metal, just as a lightning-rod quietly conducts the electric fluid to the ground. If there were explosive gases generated in a boiler—such as oxygen and hydrogen—in the proportions which compose water, and if an electric spark were sent through them, they would explode, and shatter the boiler to pieces; but by no other method of operation that science has revealed can electricity cause an explosion in a boiler. To demonstrate the correctness of this theory, therefore, its advocates have not only to prove that electrical discharges take place in boilers, but that hydrogen and oxygen gases, in a free state, are also present. This proof will not be easy to furnish; and, until it is produced, the advocates of the pressure theory stand upon an impregnable basis.

BACK NUMBERS ELECTROTYPED.—The unexpectedly large demand for the first five numbers of the New Series of the SCIENTIFIC AMERICAN has completely overturned all our calculations; so much so that, in the brief space of one month, we find our edition of Nos. 1, 2, 3, 4 and 5 exhausted; and as the demand still continues, we have determined, if possible, to supply it, and have therefore caused those numbers to be re-set and electrotyped, so that we can now supply subscribers and news-agents to an unlimited extent. The present issue is also electrotyped, and it is our intention to perpetuate every succeeding number by the same means. This adds very greatly to our expense, but we think we shall not be disappointed in the calculation we made at the outset. Our friends have responded nobly to our call, and we still hope they will use their influence for the wider circulation of this journal, which is acknowledged to be without a rival for interest and utility. We have some choice things in prospect, which we hope soon to present to our readers for their perusal.

POPULAR ARTICLES.—Since the commencement of our New Series we have published several long articles of a popular character. This feature has been commended by our readers, and we shall continue it from week to week, or so often as we can meet with such contributions, either original or selected, as are likely to interest our readers. In the case of the article entitled "Railway Nightmares," by Dickens, which appeared in our first and second numbers, biting sarcasm is employed to show forth the evils of a giant system which, in its varied workings, has ruined many an honest shareholder. This author has reformed many abuses in England by his peculiar pungent style. The columns of the SCIENTIFIC AMERICAN are open to discussions designed to show up the evils of any of our great corporate industrial institutions, which discussions, however, must avoid any reflections of a personal character.

TO STOP MOUSE HOLES.—Stop mouse holes with plugs of common hard soap, and you will do it effectually. Rats, roaches and ants will not disregard it.

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AIR AND SUNSHINE.

"Pure air for the lungs and bright sunlight for the eyes" is a physiological maxim which should never be forgotten. On this subject the Springfield *Republican* has some very good remarks. It says:—"When the trees about a dwelling shade the ground so thoroughly that the grass and shrubbery will not grow, and the rooms of the house have a constant air of dampness and gloom, and the outside gathers moss and mold, it is time to make war upon the trees and open a pathway for the sunshine and warm air. If it were not for the beneficent visits of the hot winds from sunnier spots occasionally, such homes would be as noisome and fatal as tombs. The vital statistics of cities show the sunny side of the streets to be the most healthy, notwithstanding the insane efforts made even by the inhabitants of cities to exclude the little sunlight that attempts to reach them; and we have no doubt that the statistics of country residences would show the same general fact. A certain amount of shade is essential to comfort, but when it reaches the point of excluding sunshine altogether, it becomes a positive evil. When we talk about opening windows and doors, we know what the exclamation of tidy housekeepers will be. Flies are a nuisance, we confess, multitudinous, disagreeable and dirty; dust from the streets is insufferable, and faded carpets are a daily mortification. But after all, are not rosy cheeked and lively children, and vigorous and cheerful women, more ornamental and more essential to the comfort of a family than the best preserved colors in the worsted work or entire immunity from the annoyance of flies? Let us welcome the visits of the healthful air and sunshine, and look out for the essential conditions of vigor and cheerfulness first of all, and if matters of mere show must be sacrificed, why, let them slide."

ELDERBERRY WINES.

As the season is at hand for collecting elderberries, we have had a number of inquiries regarding the mode of making wine from them. We will give two receipts, which will be found quite reliable if carefully followed.

1. Take elderberry juice, 10 gallons; water, 10; white sugar, 45 pounds; red tartar, 8 ounces. These are put into a cask, a little yeast added, and the whole is fermented. When undergoing fermentation, ginger root four ounces, allspice four, and cloves one ounce, are put into a bag of clean cotton cloth and suspended in the cask. They give a pleasant flavor to the wine, which will become clear in about two months, and may be drawn off and bottled. Some add brandy to this wine, but if the fermentation is properly conducted, this is not necessary.

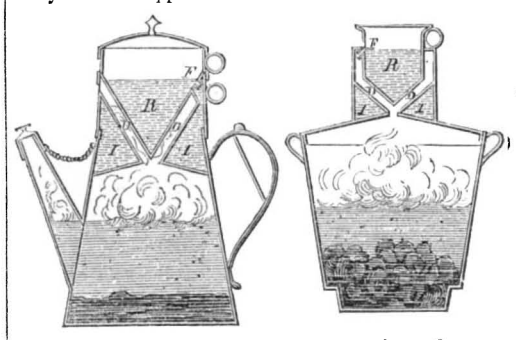
2. Take five gallons of elderberries and boil them for half an hour in the same quantity of water, adding half an ounce of cloves, two of ginger, and two of cinnamon. The whole are strained through a clean cotton cloth, or a hair seive, and considerable pressure is used to obtain all the juice. This is now put into a cask, fifteen pounds of brown sugar stirred in, and the whole fermented. It takes from two to three months before fermentation is completed and the wine ready to be bottled. Elderberries make a beautiful wine, much prized in England. Thousands of bottles of pure elderberry wines are made annually in this country for medical purposes. The flavor of this wine is very similar to that obtained from the grapes of Oporto, in Portugal.

THE GOMEZ FUSE TRAIN.

Some experiments were made by Commander Dahlgren at Washington with this patent fuse train, and to briefly give the results we quote from his report—"On the 7th of February Mr. Gomez presented his fuse train for trial, and a length of 300 feet was placed in the water as before (there had been a previous experiment last year). At 2 P. M., on the 8th, 150 feet exploded satisfactorily, discharging a howitzer on the wharf, A bottle of gunpowder tightly corked and into which the end of a train of 300 feet was led, was then sunk in 7 fathoms water, about 50 yards from the wharf: on its being ignited, a shock was sensibly felt upon the shore, and the disturbance of the water showed the powder had been exploded. On the 14th of February, the remaining 150 feet of train which had been deposited in the water on the 7th was tried and discharged powder on the shore," and he further goes on to state that the composition of the train does not shatter the gutta-percha covering, but only separates it.

BARTLETT'S HOUSEHOLD CONDENSER.

This simple little contrivance will be found of great utility in every household and will also prove itself an article of luxury from the superior manner in which many articles can be cooked by its aid. In our illustrations, which are sections, we have shown it applied to a coffee-pot and an ordinary kettle. In the former application it improves the coffee vastly, as no aroma escapes, all ascending into the space D, where by coming in contact with cold metal, kept so by water, it is condensed and thrown back into the coffee, and the coffee will admit of being boiled longer without loss of flavor, so that stronger coffee can be made than usual with less of the berry. When applied to kettles it acts in the same manner and prevents the aroma escaping from the most delicately flavored vegetables and fruits, and prevents the offensive (especially to the sick) odor of cabbages, onions or fish escaping into the room. The cover or condenser is made in two parts fitting into one another, each capable of being filled with cold water, and so arranged as to be easily emptied and cleaned, and to leave a space between the two parts so as to expose a double condensing surface to the aromatic vapor of the contents of the coffee-pot or kettle.



To use the invention, cold water is poured into the reservoir R, until it overflows at pipe F, and fills the reservoir I, when the condenser can be put on the pot or kettle, and the vapor or steam when it arises will be condensed in the space D.

The inventor is A. H. Bartlett, and it was patented April 5th, 1859. Any further information can be obtained from Messrs. Bartlett & Lesley, 426 Broadway, New York. It is an improvement on the "Old Dominion," and the manufacturers call it the "Old Java Coffee Pot," but we have preferred the title which heads our article as expressing the more extended use of the condenser.

SOUR MILK.

MESSRS. EDITORS:—Will you please give a chemical explanation of the circumstance that milk suddenly becomes sour during thunder? and oblige, C. S.

Three theories have been advanced to explain the cause of milk becoming sour under the circumstances alluded to above. By the first—probably the right one—it is held the change in milk from sweet to sour is attributable to the sultry condition of the weather, which, in such cases, is unusually favorable to fermentation and the production of lactic acid. By the second, *ozone*, which is formed in the atmosphere during lightning, is held to be the acidulous agent which changes the character of the milk; and by the third, the vibrations of the earth and air, caused by the thunder, are considered sufficient to agitate the molecules of the milk so as to change their relations, and produce lactic acid.

THE WAR.—Since our last, we have learned that peace has been made between the belligerent Powers in Europe, although without the Emperor Napoleon obtaining what he declared was the intention of the war, and on the strength of which declaration he has got many men to join his standard, namely, that "Italy must be free from the Alps to the Adriatic." The whole European press, except the French, seems to say that, as unnecessarily as the war was began, disgracefully has it terminated. For our part, we hate war, and hope that all future difficulties arising out of the peace will be settled in an amicable, or at least, bloodless manner.

We are indebted to Lucius Hart, Esq., Burling-slip, this city—a merchant (of 25 years' standing) in both the rough and manufactured metals—for much of the information in regard to the *commerce* of tin, especially of Banca.

GOLD FROM THE GRAVES.

The aboriginal inhabitants of Central America, or those people who occupied it at its discovery by the white men of the East, and many nations in South America, had a custom of burying their dead surrounded with gold. In one instance a corpse has been discovered embalmed in a case of beaten gold, and from one tomb, gold to the amount of $931,000 had been taken by the Spaniards in the sixteenth century. This mining among the graves, or *huacas*, as they were called, became of such importance that the Spanish crown sent over commissioners to collect a royalty of one-fifth of all gold so obtained, and this produced a handsome revenue. For some time these peculiar *placers* have not been much worked, but still from New Granada and Peru, they have sent several thousand pounds' worth annually to England, where it has been melted down at the British mint. By the last Californian arrival we learn that similar discoveries have been made at David, Chiriqui, the gold being in the form of roughly cast images, which were buried with the dead, evidently as votive offerings to some deity of ancient worship. There is now a great emigration to these novel "diggins," and report says that gold is very profuse. But we are inclined to think that after the country has been so well ransacked by the Spaniards, there cannot be so much as rumor would have us believe. Dr. Otis, the surgeon of the *Moses Taylor*, has brought some specimens to this city, and among them one representation of the bat, the eagle, the peccary, the frog, and other animals. The largest, representing a bat, is about five inches long by three and a half inches in width, and weighs six ounces. The gold is generally about 20 carats fine—some of it slightly alloyed with copper—and is worth as merchandize about $17 the ounce; but, as objects of curiosity, the images are sold on the spot for $20 the ounce. The images are cast and polished, and exhibit much ingenuity in the modeling. The people by whom such objects were made must have been considerably advanced in civilization. The study of American antiquities will doubtless be advanced by the discovery of these remarkable images, and we think that they should be preserved, instead of being thrown into the refiner's melting-pot, like an unfashioned nugget or scaly dust.

DISTANCES BETWEEN TREES.—The following is a useful table for setting-out trees and plants, as it gives the requisite distances at which they should be set apart:—

Name of Plants.	No. of feet apart each way.	No. per acre.
Standard apple trees	30	48
Dwarf apples	6	1,210
Standard pears and cherries	20	110
Dwarf pears, dwarf cherries and quinces	10	456
Apricots, peaches, nectarines and plums	20	110
Currants, gooseberries and raspberries	4	2,722
Blackberries and black-cap raspberries	8	681
Grape-vines	12	302
Strawberries in rows 2½ feet apart, plants 1 foot apart in the row		17,408
Strawberries for market garden, 1 foot by 4		10,888

RE-MANUFACTURE OF RAILS.—The Grand Trunk Railway Company, of Canada, have entered into a contract with a new firm to establish a rolling mill in Toronto for the re-manufacture, for a term of years, of all their old rails. The Toronto *Leader* says:—"The capital necessary to start it will not be less than $400,000; and it is calculated that it will give regular employment to 400 or 500 hands, and pay from $800 to $1,000 a day in wages. It will be the first large manufactory ever established in this city; at the same time that it will be one of the largest, if not the largest in the Province. At present not a rail can be re-manufactured in the Province."

AMERICAN RAILWAY REVIEW.—We have received the first number of a handsome quarto of 16 pages, bearing the above title. It is edited by Alexander Mann, and published weekly, at $3 per annum, in advance, by the "American Railway Bureau," at No. 19 Nassau-street, New York. This "Bureau" is an association of gentlemen versed in the construction and management of railways, organized with capital and other means, to supply a pressing public want, by collecting all important statistics and information, and furnishing correct intelligence respecting the various railways of the United States and Canada. The *American Railway Review* gives promise of high usefulness and prosperity. It is able, conservative and fearless. Our railway system has need of such a paper.

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PROGRESS ON THE PACIFIC.

When Bilboa first saw the rolling waters of the Pacific ocean casting their glorious billows upon the still more glorious shores of Central America, little did he dream of the vast future that lay before some portions of that land. Could he now awake from the long sleep of death he would not recognize the waters which he discovered, teeming as they are with steamboats, clippers, and the products of all nations' industry, passing from clime to clime. Our rising Golden State has made such rapid strides of progress during her brief existence as to even astonish us, who are used to wondrous changes; how much, therefore, would old Bilboa be amazed to think that he discovered the highway to a peninsula of such vast importance and productive capabilities.

We have received from the Rev. James Rogers, A. M., the Professor of Natural Science in the University of the Pacific, at Santa Clara, Cal., the catalogue of the institution for the present year, and find that there are 112 male students and 66 females who have attended the courses of study. We have also received the announcement of the medical department at San Francisco, which informs us that the medical faculty of that city "feel warranted in claiming for San Francisco a superiority in climate over any of the eastern cities; which will render the otherwise arduous labors of the student comparatively easy and agreeable on the one hand, and facilitate the study of practical anatomy irrespective of season, on the other. Indeed, the opportunities for prosecuting the study of practical anatomy in this city are superior to any known region of the globe. Independent of the advantages in climate, material for dissection is abundant and cheap, and our salubrious breezes not only preserve the subject for an indefinite period of time, but secure the health of the student from injury, the consequence of effluvium, so constant an attendant upon dissections elsewhere." This is valuable information, for all of us know how many a promising and learned physician has died at the very commencement of his career from diseases or poisons caught by too close attention to the dissecting-room in an unhealthy climate. We wish the new school success, and that it may advance at the rate which seems to characterize that favored region.

THE USES OF PAPER.

In some things we have yet much to learn from nations which we call *barbarian*. This is the case with those curious people, the Japanese. They make beautiful Japanned ware of various materials totally unknown to us, and possessing such qualities that our artists have in vain endeavored to imitate them. It is the same with their paper. We entertain a very high opinion of our skill in making paper and applying it to different purposes, but surely we are very far behind the Japanese in such manufactures. A correspondent of *Blackwood's Magazine*, who visited that island with Lord Elgin, states that it is wonderful to see the thousand useful as well as ornamental purposes to which paper is applicable in the hands of the Japanese. He saw it made into materials so closely resembling Russian and Morocco leather and pig-skin, that it was very difficult to detect the difference. With the aid of peculiar varnish and skillful painting, paper made excellent trunks, tobacco-bags, cigar-cases, saddles, telescope-cases, the frames of microscopes; and he even saw and used excellent water-proof coats, made of simple paper, which did keep out the rain, and were as supple as the best india-rubber. The Japanese use neither silk nor cotton handkerchiefs, towels nor dusters; paper, in their hands, serves as an excellent substitute. It is soft, thin, tough, of a pale-yellowish color, very plentiful and very cheap. The inner walls of many a Japanese apartment are formed of paper, being nothing more than painted screens; their windows are covered with a fine translucent description of the same material; it enters largely into the manufacture of nearly everything in a Japanese household; and he saw what seemed to be balls of twine, but which were nothing but long shreds of tough paper rolled up. If a shopkeeper had a parcel to tie up, he would take a strip of paper, roll it quickly between his hands, and use it for the purpose; and it was quite as strong as the ordinary string used at home. In short, without paper, all Japan would come to a dead lock; and, indeed, lest by the arbitrary exercise of his authority, a tyrannical husband should stop his wife's paper, the sage Japanese mothers-in-law invariably stipulate in the marriage settlement, that the bride is to have allowed to her a certain quantity of paper.

NEW INVENTIONS.

PAPER-FEEDING MACHINE.—All machines which have to perform any operation upon single sheets of paper require the sheets to be fed to them at regular intervals to receive the full action of the machine. This feeding to printing-machines, ruling-machines, and others, is now generally performed by hand, and requires the constant and unvarying labor and attention of one person for each sheet which he feeds. To obviate this, G. H. and Sylvester Ferguson, of Malden Bridge, N. Y., have invented and patented a machine which consists in an arrangement and combination of a series of feed and friction rollers, with an adjustable friction stop or rubber, whereby the sheets of paper of any size, texture or thickness, either wet or dry, will be regularly and speedily fed from the pile singly.

BITUMINOUS COAL-BURNING FIRE-BOX AND FURNACE.—Richard Gill and George W. Grier, of Altoona, Pa., have invented an improvement which relates to a novel, simple and economical means for introducing atmospheric air into a bituminous coal-burning fire-box or furnace, whereby all inflammable gases within the fire-box or furnace evolved by the combustion, or rather, the imperfect combustion of the coal, will be mixed to a point of saturation with the air and at an igniting temperature, so that the greatest quantity of heat may be obtained from a given quantity of fuel. The invention consists in having an air chamber, provided with a series of tubes, placed within the fire-box or furnace, and used in connection with deflectors, whereby the desired end is attained.

STUD AND VEST BUTTON.—The common button which is firmly secured to the garment is rapidly going out of fashion for shirts and vests, and one that is movable is rapidly taking its place. Indeed, the latter is so convenient (especially to bachelors, who have to trust their buttons to a careless laundress) that they ought to be more generally adopted than they are. One objection to them is their insecurity; but this is overcome by the invention of Henry Simon, of Providence, R. I., which consists in a certain construction of and mode of applying a spring to the inner portion or fastening of the stud or button, whereby it is enabled to be very easily inserted in and removed from the holes in the shirt or vest, and is made very secure when in place.

BUTTON-HOLE SEWING-MACHINE.—One of the complaints against the ordinary sewing-machines is that they will not sew button-holes and such like work; and the careful housewife who possesses one of these valuable aids to household economy has still to do this portion of the work by hand. Messrs. E. A. Goodes and E. L. Miller, of Philadelphia, Pa., have invented and patented a machine which forms a stitch of novel character, suitable for working button-holes, eyelet-holes, over-seaming, and for other kinds of work in which it is necessary or desirable for the stitches to pass over an edge. This machine will fully meet the objection stated above.

MACHINE FOR ENAMELING MOLDINGS. — Robert Marcher, of New York City, has invented an improved machine for this purpose, which has reference to a former patent of the same inventor. The present one consists in an improvement in the hopper which contains the necessary composition for enameling, whereby the hopper is rendered capable of expanding or contracting to compensate for the inequalities of the molding, and also in the adaptation of feeding devices, which permit the employment of any power as a motor.

IMPROVED DIE-STOCK.—Simeon Goodfellow, of Troy, N. Y., had a patent granted him, December 6, 1853, for an improved arrangement of screw-cutting dies, in which he claimed the arrangement of circular dies, described in said patent. He has now invented and patented an improvement on the former one, which consists in arranging, in combination with a circular die or dies, as set forth in the former patent, a vibrating die or chasing tool in the movable die-holder, in such a manner as to accommodate itself to the inclination of the thread when the die begins to cut on the surface. He has assigned the invention to himself and John Fish, of the same place.

SAWING-MACHINE.—In this machine, the invention of E. H. Hancock, of Augusta, Ga., the strips or bolts are fed up to a series of circular saws, by means of an endless chain, which has two oblique head-blocks attached to it. One of the head-blocks darts underneath the bed of the bench as soon as the log has been fed the required distance, and the other darts up from under the bench, ready to take hold of a new strip or bolt. The strip or bolt is held steady by a long adjustable guide, and the forward end of the bolt is held down by hinged guards or levers, which partly overhang and stand in the rear of the saws. The levers serve most effectually to prevent the planks flying back and striking the operator, in case the teeth of the saws hang in the same at the completion of the sawing through the bolt. This is a very simple and excellent machine.

FOREIGN SUMMARY—METALS AND MARKETS.

The peace declared between those belligerent powers, France, Sardinia and Austria, came upon the commercial world so suddenly that much uncertainty and doubt as to the finale of the whole struggle, still prevails. The whole affair seems to be left in a tantalizing state of speculation as to what is to come out of it—whether the quarrel is merely like a wound healed over the surface, but still festering underneath, and causing a pain which will only find relief by another issue. This is the state of feeling in the London markets, and business generally (except in one branch—the cotton) appears affected with it.

For the week ending July 16th, the reported sales of cotton in Liverpool were 107,000 bales, of which 12,000 were for export, and all qualities had advanced from half a cent to three-fourths of a cent per pound. There were 688,000 bales in Liverpool of which 608,000 were American.

PRICES OF FOREIGN METALS, JULY 15.

	£ s. d.		£ s. d.
Staff. bar-iron, per tun..	8 00 00	Swedish steel, in faggot	21 00 00
Common English.....	7 00 00	Copper in tile.....	107 10 00
Single sheet.....	9 10 00	British pig lead.....	22 15 00
Double sheet.....	11 00 00	Tin, block.....	120 00 00
Round nail rod.....	8 00 00	Bar.....	130 00 00
Square nail rod.....	9 00 00	Banca.....	134 00 00
Ho p iron.....	9 00 00	Plates (per box).....	1 19 00
Welsh iron rails.....	5 15 00	Spelter.....	19 00 00
Staffordshire pig-iron...	3 10 00	Zinc, in sheets.....	28 10 00
Scotch pig-iron.....	2 11 00	Copper sheathing, per lb	00 1 00
Swedish iron.....	13 00 00	Brass sheathing.....	00 00 10
Swedish steel.....	20 10 00		

Few inquiries have recently been made for rails, and the ordinary American sections were easily purchased for £5 15s. per tun.

New York Markets.

COAL.—Foreign cannel, $8; Anthracite, from $4.50, $4.75, to $5 50

CORDAGE.—Manilla, 8¾c. per lb.

COTTON.—The sales hove been good this week again, and several thousand bales have been sold at a considerable advance. Good ordinary Upland, Florida and Mobile, 10½c.; Texas, 11c.; Middling fair from $13½c. to 14c.

COPPER.—Lake Superior ingots at 21c. per lb. for cash. Copper bolts, 30c. Sheathing, 25c.

FLOUR.—There has been a still further reduction in flour. Genesee brands, $5.25 a $8; Ohio choice, $5.50 a $7.25; common brands from $4 15 up to $6.

HEMP.—American undressed, $140 a $150; dressed from $190 a $210. Jute, $95 a $90. Italian scarce. Russian clean, $210 a $215. Manilla 6¾c. a 6¾c. per lb.

INDIA-RUBBER.—Para, fine, 55c. a 57½c. per lb.; East India, 36c. Carthagena, 25c. a 37½c.

INDIGO.—Bengal, $1 a $1.65 per lb.; Manilla, good to prime, 80c. a $1.10; Guatemala, $1.05 a $1.25.

IRON.—Anthracite pig, $22 a $23 per tun. The demand for Scotch has been more active, with a rise in price from $24 to $24.50 per tun. Swedish bar, ordinary sizes, $88 a $90; English refined, $53 a $54.50; English common, $43 a $45. Russian sheet, first quality, 11½c. a 12c. per lb.; English, single, double and treble, 33/c. a 37/c.

LEAD.—Galena, $5.80 per 100 lbs.; German and English refined, $5.70.

LEATHER.—Oak slaughter, light, 34c. a 36c. per lb.; Oak, heavy, 33c. a 35c.; Oak, crop, 40c. a 42c.; Hemlock, middle, 25c½. a 26½c.; Hemlock, light, 25c. a 25½c.; Hemlock, heavy, 23½c. a 24½c; Patent enameled, 16c. a 17c. per foot, light. Sheep, morocco finish, $7.50 a $8.50 per dozen. But a moderate business in oak and hemlock, and a slight decline in the prices of some classes.

NAILS.—Cut are quiet but steady at 3c. a 3¾c. per lb. American clinch sell in lots, as wanted, at 5c. a 6c.; wrought foreign, 3c. a 3½c.; American horseshoe, 15c. a 20c.

OILS.—Linseed, city made, 60c. per gallon; whale, bleached spring, 54c. a 56c.; sperm, crude, $1.20 a $1.27; sperm, unbleached spring, $1 35; lard oil, No. 1 winter, 85c, a 90c.; extra refined rosin, 30c. a 40c.; machinery, 39c. a 100c.; camphene, 45½c. a 47½c.; coal, refined, $1.12 a $1.50.

RESIN.—Common, $1.77½ per 310 lbs. bbl.; No. 2, &c., $1.80 a $2.12½; No. 1, per 280 lbs. bbl., $2.25 a $3; white, $3.25 a $4.50; pale, $4.50 a $6.25.

STEEL.—English cast, 14c. a 16c. per lb.; German, 7c. a 10c.; American spring, 5c. a 5½c.; American blister, 4½c. a 5½c.

TALLOW.—American prime, 10¾c, to 11c., per lb.

TIN.—Banca, 33c. per lb. Plates per box, $7.12 a $9; a rise since our last issue.

WOOL.—Saxony fleece, 50c. a 55c. per lb.; full blood merino, 40c. a 48c.; ½ and ¾ merino, 40c. a 44c.; native and ¼ merino, 34c. a 38c.; extra, pulled, 45c. a 50c.; superfine, pulled, 37c. a 41c.; No. 1, pulled, 30c. a 33c.; lamb's, pulled, 31c. a 38c.; California, fine, unwashed, 20c. a 28c.; California, common, unwashed, 10c. a 17c.

ZINC.—Sheets, at 7½c. a 7¾c. per lb.

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24,850.—Asa Brooks, of Tolland, Conn., for an Improved Mode of Setting Logs in Saw-Mills:

I claim the application and combination of the gear. A, and screw-shaft, L, the traveling ratchet, E, and chock, c, the stops, F and K, the spring pawl, B D for the purpose as described and substantially as set forth.

24,851.—H. F. Bond, of Hudson, Wis., for an Improved Bread Slicer:

I claim, first, The movable tray, G, operated automatically by the motion of the knife, C, in the manner substantially as set forth.

Second, I claim the bar, T, arranged substantially as described for the purpose specified.

24,852.—S. L. Bond, of Greenwood, S. C., for an Improved Tweer:

I claim the arrangement and combination of the two pipes, C C, having their orifices opposite to each other, with the air-chamber, B, so that the two currents of air on entering the chamber will oppose each other, and thus uniformly diffuse the air, as shown and described.

[The object of this invention is to introduce the air to the fire in such a manner that it reaches a larger quantity of coal with a uniform blast, and that a fire can be supplied large enough for any purpose. The invention consists in introducing air from the bellows-pipe. and compressing it to a certain degree into an air-chamber, the cover of which is perforated with a number of holes, so that the air escaping from the chamber is spread over a comparatively large area and with a uniform force. This cover when burnt out is so arranged as to be easily replaced by a new one.]

24,853.—John Biberthaler, of New York City, for an Improved Iron Folding Bedstead:

I claim the arrangement of the bed bottom in two parts, one of which, A, being about two-thirds of the whole length of the bed, and to which the legs are attached capable of turning under said part, when required, and attaching the other part, D (and which forms the upper or head part of the bed), to the legs nearest the head, in such a manner that the said part, D, may be turned over the top of the bottom part, A, while the legs to which the same is attached are turned under the said part, A, in the manner and for the purpose substantially as described.

I further claim fixing the head part of the bed, D, when unfolded, either to the legs, B, or to the bottom part, A, by means of bolts, or pins, n, in such a manner that by said bolts the inclination of said part, D, may, at the same time, be regulated to any desired position, substantially as described and set forth.

24,854.—Henry Bessling, of New York City, for an Improvement in Reefing Sails:

I claim the slides, d d', applied to work along the jackstay, or other suitable portion of the yard, in combination with reef-points extended from the back of the sail, up through the jackstay, or yard, and with the reef pendants, substantially as described,

And, without confining myself to the particular construction of the pawls, I I, I claim securing the reef by means of pawls applied to the yard, to operate in combination portions of the reef pendants made of chain, substantially as described.

[This invention consists in carrying the points of each reef of a sail up to the yard, and attaching them to slides which are fitted to work along the yard, and to which are attached the reef pennants. By hauling on the reef pennants, the slides are caused to move longitudinally, and to draw up the reef points, and so reef the sail from the deck.]

24,855.—Alex. Beckers, of New York City, for an Improvement in Stereoscopic Instruments:

I claim. first, Placing the eye-glasses, B, in a movable cylinder, A, in such a manner that opaque pictures, O', and O'', placed back to back, may be viewed by the same pair of eye-glasses, the direction of the said eye-glasses being varied by the partial rotation of the cylinder, to suit the opposite position of the pictures, substantially as described.

Second, The construction of the picture holders with a double hook N, substantially as described.

24,856.—E. C. Custer, of Evansburgh, Pa., for an Improved Machine for Stoning Cherries:

I claim the described machine for stoning cherries, constructed in a manner substantially as specified, with its spirally grooved cylinder, A, and adjustable stripper, E, arranged and operating as set forth.

24,857.—J. M. Clark, of Philadelphia, Pa., for an Improvement in Flour Bolts:

I claim the slide valve, d, or a series of slide valves, d, without holes in them, so arranged and operating with the apertures, e and e', in the sides of the bolting chest, that either of these apertures can be opened or closed, or both closed when required, for the purpose of turning the material as desired, in either of three directions, as set set forth.

24,858.—B. Wells Dunklee and W. B. Moore, of Boston, Mass., for an Improved Steam Heating Apparatus:

We claim the combination of the tubes, E, casing, P, inner and outer reservoirs C and D, and condensation pipes, I, and escape pipe, J, with its valve, d, with petticoat chamber, F, and vaporizing pipe, h, and the use of the iron known as the Poleux patent metal alloy coating, substantially as and for the purposes set forth in the specification and drawings.

24,859.—Chas. Frost, of Waterbury, Conn., for an Improved Door Fastening:

I claim the employment or use of the drop plate, D, constructed of the form, and applied to the door or doors, substantially as and for the purpose set forth.

[A drop plate is applied to the door in this invention in such a manner as to insure a proper fastening, and at the same time dispense with the use of the auxiliary fastenings or bolts hitherto required on one of a pair of folding doors. The invention is more especially designed to be applied to gates and the doors of barns and outhouses, and to supersede the various kinds of latches hitherto most generally used for fastenings.]

24,860.—Henry Fisher, of Alliance, Ohio, for an Improvement in Harvesters:

I claim attaching the draft or draw-bars, M M', to the arms, L L', in the manner and for the purposes substantially as set forth.

I also claim the peculiar arrangement and combinaton of frames, I K and M, tongue, N, spur, e, and arm, g, in relation to each other and to the main shaft, B, to operate in the manner and for the purpose specified.

24,861.—G. H. Ferguson and Sylvester Ferguson, of Malden Bridge, N. Y., for a Machine for Feeding Paper to Printing Presses:

We claim feeding sheets of paper, singly, to printing-press, paper-ruling, or other machine, requiring the feed of a single sheet at a time, by means of a feed roller, G, feed roller, I, and adjustable friction stop, J, or the equivalents thereof, when arranged essentially as specified.

24,862.—B. L. Griffith, of Hazleton, Pa., for an Improvement in Locomotive Boilers:

I claim the deflectors, G G', and H, arranged within the space, C, between the fire-place and the tube sheet of a locomotive boiler, substantially as described, in combination with openings in the fire-box for the admission of atmospheric air, for the purpose specified.

24,863.—E. A. Goodes and E. L. Miller, of Philadelphia, Pa., for an Improvement in Sewing Machines:

We claim the combination of the needles, n, and h, the hook, h, and the tongue, L, the whole applied, arranged and operating substantially as described.

24,864.—C. M. Gould, of Worcester, Mass., for an Improved Submarine Helmet Window:

I claim the application to submarine helmets of the above-described window, substantially in the manner and for the purposes described.

24,865.—Chas. Glassborow, of Philadelphia, Pa., for an Improvement in Pianofortes:

I claim constructing the string frame of an upright piano, with two pin blocks and other appliances for receiving two sets of strings, and two distinct sounding boards, the strings being arranged, one set on one side, and the other set on the opposite of the frame, the two sounding boards being connected together, and the whole being otherwise constructed, substantially in the manner and for the purpose set forth.

24,866.—James Gilfillan, of Hartford, Conn., for an Improvement in Valves for Water Closets:

I claim the combination of elastic tubular spring, R, piston, D, chamber, E, operating in the manner as and for the purpose described.

24,867.—Richd. Gill and G. W. Grier, of Altoona, Pa., for an Improvement in the Furnaces of Locomotive Engines:

We claim, in combination with the fire-box of a coal-burning locomotive boiler, a water deflector, having a series of small openings through it, and extending up over the fire, as represented, and an air passage behind or over it, which communicates with the external air, for the purpose of introducing atmospheric air, in small jets, over the fire, substantially in the manner and for the purpose set forth.

24,868.—Enos Hartzler, of Orville, Ohio, for an Improved Pump:

I claim the arrangement of the pipes, E F G H, valves, c c c c, springs, x x x x, and spring, a, with the rod, I, box, C, and stock, A, the several parts being combined and operating substantially as and for the purpose specified.

24,869.—E. H. Hancock, of Augusta, Ga., for an Improved Sawing Machine:

I claim, first, The combination of the yielding guard levers, or their equivalent, with the rotary saws, substantially as and for the purpose described.

Second, The head blocks, E swinging guide, E, circular saws, A, and guard lever, C, when arranged and operating substantially as and for the purpose set forth.

24,870.—Wm. Hall, of North Adams, Mass., for an Improvement in Sewing Machines:

I claim, first, The combination of the needle carrier, B, pivoted bar M, connecting rod, J, slide, I, pitman, H, and crank, G, when arranged and operating in the manner and for the purpose substantially as set forth.

Second, The combination of slide, I, and rod, J, or its equivalent, with a vibrating needle carrier, in such manner as to produce two vertical motions on the needle, during each single horizontal motion of the slide, I, substantially in the manner fully set forth.

24,871.—Geo. Hall and Alonzo Scudder, of Morris, N. Y., for an Improved Washing Machine:

We claim the employment of a corrugated flexible metallic concave, B, stretching across the lower part of the machine, substantially as and for the purpose shown and described.

[A corrugated concave is used in connection with a swinging corrugated and convex rubber, both being placed in a suitable box or case, and arranged se as to form an excellent washing device.]

24,872.—C. H. Hersey, of Boston, Mass., for an Improvement in Rotary Pumps:

I claim the combination of the flanged shaft, with the hinged valve and cone, substantially as described for the purpose specified.

24,873.—Benjamin Hinkley, of Troy, N. Y., for an Improved Bedstead:

I claim the arrangement of the dovetailed tenons, m or m't on the end rails, B, and corresponding dovetailed mortises, n or n', in the full posts, K, with the side rails, J, and longitudinal tension rods, a, as and for the purposes set forth.

24,874.—F. A. Hoyt, of Boston, Mass., for an Improved Water and Alarm Gage for Steam Boilers:

I claim the arrangement of the balanced valve chamber and valve, the leading pipe thereof and the whistle, with reference to the dry steam chamber, C, the indicator chamber, B, and the valve lever, and the indicator hand, connected together and arranged in the two chambers, B and C, as specified,

24,875.—Richd. M. Hoe, of New York City, for an Improvement in Printing Machines:

I claim stopping the sheet of paper as it issues, after its first side is printed, and imparting to it a retrograde motion, thus returning it backwards, or in reverse order, to the impression cylinder, for the purpose of printing the second side, by the means substantially as described.

24,876.—Frederic Kettler, of Milwaukie, Wis., for an Improvement in Force Pumps:

I claim the combination and arrangement of a force pump, as described, for the purpose set forth.

24,877.—Frederic Kettler, of Milwaukie, Wis., for an proved Force Pump:

I claim the combination and arrangement of a force pump, as described for the purpose set forth.

24,878.—Geo. T. Kearsing and Wm. F. Kearsing, of Butte City, Cal., for an Improvement in Mills for Crushing Quartz:

We claim the arrangement and combination of the driving shaft, C, arms, B, rods, A, and runner, h, substantially as and for the purpose described.

24,879.—Robt. Marcher, of New York City, for an Improvement in Machines for Enameling Moldings:

I claim, first, The elastic or yielding sides, a a, of the hopper, B, arranged to operate substantially as and for the purpose set forth.

Second, In combinatisn with the hopper, B. the reciprocating dog, S, attached to the bed, E, and operated as shown; and also in combination with said hopper, the feed rollers, L L'. P P', either or both feeding devices being employed for the purpose specified.

24,880.—Chas. Messenger, of Warren, Ohio, for an Improved Bedstead:

I claim the angular and oblique slot, F, and pin, G, in combination with the plate or key, D, when arranged in connection with the jointed rails, substantially as described and for the purpose set forth.

24,881.—Joseph W. Morton, of Plainfield, N. J., for Improvement in Sewing Machines:

I claim my improved loop check, or thread-holder, for the Wheeler & Wilson sewing-machine, viz., a loop-check or thread-holder, which is composed of hair bristles, or other suitable fibers, by compacting them into a firm mass of suitable size, and then combining the same with a sewing-machine, in such a manner that the ends of the said fibers will bear against a portion of the rotating hook of said machine, substantially as set forth.

24,882.—Richd. Montgomery, of New York City, for an Improvement in Machines for Manufacturing Waved and Corrugated Metal Plates:

I claim the combination of the peculiarly constructed roll, I, with the peculiarly constructed roll, J, arranged and operating in relation to each other, as shown, whereby the manufacture of the waved corrugated metallic plate, with margins of greater thickness than the middle as patented to me on the 21st June, 1859, is facilitated, while a portion of each corrugation is formed at the same time, as described,

24,883.—Richd. Montgomery, of New York City, for an Improved Machine for Manufacturing Waved and Corrugated Metal Plates:

I claim the combination of the peculiarly formed roll, I'; with the peculiarly formed roll, J', arranged and operating in relation to each other, as shown and set forth, whereby the manufacture of the waved, corrugated metallic plate, with margins of greater thickness than the middle, as patented to me on the 21st of June, 1859, is facilitated, while only "one corrugation" is formed at the same time, as described.

24,884.—Daniel Morris, of Bangor, Maine, for an Improvement in Shirt Studs:

I claim the improved manufacture of shirt studs, as constructed with a metallic facing, A, and an anti-soiling spool or guard, B, arranged and combined together, substantially as specified.

24,885.—Joseph Newman, of Baltimore, Md., for an Improvement in Platforms between Railroad Cars:

I claim the expanding mesh or lattice work described, when attached by a single point at each end, substantially in the manner set forth, to be used as a bridge or gangway between railroad cars.

24,886.—Suspended.

24,887.—Ira Robbins, of Hughesville, Pa., for an Improvement in Gates for Railroads:

I claim the shafts, s s', having arms, a b, as described, in combination with the shaft, B, lever, A, train of wheels, C C C, spring detent, g, spring, f, and the several rods connecting the aforesaid parts, substantially as set forth, for operating the sliding gate, G.

24,888.—David B. Rogers and Joel A. Wood, of Pittsburgh, Pa., for an Improvement in Springs for Railroad Cars:

We claim the combination of a series of plate springs, constructed and arranged as described, with a box in which they are inserted, and a follower, the spring box being either separate from or forming part of the truck, substantially in the manner and for the purposes set forth.

Also making and using the plates or leaves of the spring, constructed and arranged as hereinbefore described, of different thicknesses in the same series, for the purpose of adapting the spring to the varying degrees of pressure to which it may be subjected from time to time.

24,889.—Harrison Roberts, of Mormon Island, Cal., for an Improvement in Gold Washers:

I claim the arrangement of the sluice, B, in combination with the hopper, A, and with the supply channel, C, in such a manner that the water strikes the dirt from below, and that the hopper is made self-supplying, substantially as specified.

[This invention consists in arranging the supply chamber and the sluice in such relation to the hopper that the water strikes the dirt contained in the hopper from below, where by the hopper is made self-supplying and the quantity of dirt washed depends entirely on the force of the stream.]

24,890.—Isaac R. Shank, of Buffalo, Va., for an Improved Biscuit Board:

I claim the arrangement and combination of trap boards, H H, beveled strips, G G levers, I I, and vertical pins, J, substantially in the manner and for the purposes set forth.

[This is a frame or chest so constructed as to hold meal and flour, with a table on the top on which the dough can be worked, and trap-doors in this table which, when closed are perfectly flush with it, can be opened into the flour or meal receptacles by simply pressing on pins, they being opened and closed by a system of levers and pins.]

24,891.—Henry Simon, of Providence, R. I., for an Improvement in Shirt Studs:

I claim the movable elbow piece, d e, spring, g, and lever, h, applied in combination with each other and with the fixed shank, c, and in relation to a fixed elbow piece, a b, substantially as described.

24,892.—Isaac M. Singer, of New York City, for an Improvement in Sewing Machines:

I claim making the needle carrier with a mortise, substantially as described, in combination with the needles, a series of blocks having parallel sides grooved to receive the needles, and with a clamp screw, or its equivalent, all substantially as described and for the purpose set forth.

24,893.—John Taggart, of Roxbury, Mass., for an Improvement in Nine-pin Balls:

I claim the new or improved article of manufacture, or nine-pin ball, as composed of a hollow metallic body, A, and a covering, B, of india-rubber or other suitable elastic material, the same being constructed and arranged in manner as set forth.

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24,894.—Geo. J. Washburn, of Worcester, Mass., for an Improvement in Boring Tools:

I claim giving the stock or shaft of a boring screw, driving or other tool, a continuous rotary motion in one and the same direction, by means of a nut or sleeve, which is moved in a rectilinear reciprocating direction on said shaft, when constructed and arranged substantially in the manner described.

24,895.—Amos Webb, of Savannah, Ga., for an Improvement in the Construction of Railroads:

I claim the arrangement of the ties, A, in alternate reversed inclined positions, as and for the purpose shown and described.

[This invention consists in placing or laying the ties or sleepers of railroads angularly in the ground or in such position that their sides will be inclined relatively with vertical planes and their upper surfaces inclined from a horizontal plane, whereby many advantages will be obtained.]

24,896.—Chas. A. Wilson, of Cincinnati, Ohio, for an Improvement in Apparatus for Warming by Steam.

I claim the valves, E F f g, adapted and arranged substantially as set forth, in the lower or discharging end of the branches, coils or radiators of a system of steam heating pipes, and closable automatically by heat, in the manner and for the purposes explained.

24,897.—Chas. A. Wilson, of Cincinnati, Ohio, for an Improved Steam Radiator:

I claim the described arrangement of a series of tubes or boxes, 1 2 3, &c., provided with corresponding apertures, A, and nozzles, B, to permit circulation of steam and receive bolts or rods, D, which extend from top to bottom of the tier, the whole being adapted in the manner set forth, to admit of varying the extent of radiating surface while that of the floor room occupied remains unchanged.

24,898.—Parker Wineman, of Loydsville, Ohio, for an Improvement in Churn Dashers:

I claim a cylindrical dasher for churns, formed with a perforated top provided with a movable cap or cover and with hinged valves, arranged in such manner that cream may be received within the dasher at each downward motion thereof, and all operating substantially as described for the purposes set forth.

24,899.—Edwd. F. Woodward, of Brooklyn, N. Y., for an Improved Safety Guard for a Ferry Wharf:

I claim the employment of the apron, g, for the purposes set forth.

24,900.—Geo. H. Woodworth, of Brooklyn, N. Y., for an Improvement in Venitian Blinds:

I claim the eyes, 2 2, or staples passing the cords, f f, and attaching the tapes, d d, to the blind slats, e e, in the manner and for the purposes substantially as specified.

24,901.—John N. Wyckoff, of Brooklyn, N. Y., and Thos. M. Fell, of Orange Mines, Va., for an Improved Ore Washer and Amalgamator:

We claim a concentrator, constructed with a series of boxes or partitions, having curved bottoms communicating one with the other, and driven transversely for the purpose of separating poor from rich deposit, all as described.

24,902.—John W. Wyckoff, of Brooklyn, N. Y., and Thos. M. Fell, of Orange Mines, Va., for an Improvement in Gold Amalgamator:

We claim the application of heat by steam, or otherwise, to vessels, pans, or cylinders, keeping the contents well triturated or mixed at an elevated temperature, the whole operating in the manner described, so as to amalgamate the prepared ore by the use of mercury and alkali, as specified.

24,903.—Eliza Blake, of Albany, N. Y. (executrix of Robt. Blake, deceased), assignor to Blake & Son, of same place, for an Improved Wood-saw:

I claim the new manufacture of wood-saws, in the manner set forth, meaning by this, to claim only the sole right to manufacture, according to the mode of construction herein set forth, the special kind and character of saws known as wood-saws, and clearly defined and represented in the description and drawings.

24,904.—J. Burr, of Baltimore, Md., assignor (through mesne assignment) to Geo. A. Fayman, of Washington, D. C., for am Improved Clothes-frame:

I claim the seat, S, capable of movement on the shaft in one direction only and provided with the weighted detent, as set forth, and the ring, R, movable theron without bearing against the shaft, in combination with the shaft, A, arms, D, braces, B, and cords, E, arranged and operating as and for the purposes described.

24,905.—J. W. Fischer (assignor to himself and Chas. Fischer), of New York City, for an Improvement in Pianofortes:

I claim the bar, l, beneath the dampers, i i, and above the piano strings, actuated by the levers, m n, or their equivalents, in the manner and for the purposes specified.

24,906.—Simeon Goodfellow (assignor to himself and John Fish), of Troy, N. Y., for an Improvement in Screw Stocks:

I claim the cutting die, G, in combination with the vibrating circular plug, F, and the movable holder, D, when the same are arranged and operated essentially as specified.

24,907.—Alfred Guthrie (assignor to Wardell Guthrie), of Chicago, Ill., for an Improved Churn:

I claim the combination and arrangement of the cranks, C C C C, connected by the plate, D, or its equivalent, operating in the manner and for the purpose set forth and explained, substantially as described.

24,908.—Albert H. Hook, of New York City, assignor to Wm. A. Horstmann, of Brooklyn, N. Y., for an Improvement in Glass-polishing Machines:

I claim the combination of the apparatus for producing the reciprocating longitudinal motion and continuous lateral motion given to the polishing blocks, consisting of the screws, k, worm-wheel, l, worm, m, and its connections with the driving power, arranged and operated in the manner set forth.

24,909.—Hezekiah Johnston and Wm. J. Matthews, of Collinsville, Ill., assignor (through mesne assignment) to Hezekiah Johnston, of same place, for an Improvement in Fire-escape Ladders:

We claim the combination of the endless belt, F, with the folding ladders and the platform, M, in the manner described.

24,910.—James H. Murrill (assignor to Egerton, Dougherty, Words & Co.), of Baltimore, Md., for an Improvement in Machine for Cracking Sugar:

I claim the employment of a vibratory saw, H, when constructed and operated in the manner described, in combination with a gage plate, P, and hopper, G, arranged substantially in the manner and for the purposes of sawing off slabs of sugar and directing them between crushing rollers,

I claim the employment of rollers, A A, moving in unison with each other, when constructed with cruciform cutters, a a, as described, for the purpose of perfectly dividing slabs of sugar into regular cubic portions, substantially as set forth.

I claim the construction of a hopper, o, when provided with parallel grooves, or their equivalent, when used in combination with a circular saw, constructed and operated in the manner and for the purposes as set forth.

24,911.—W. H. Nichols (assignor to A. H. Markham, W. H. Nichols and David Strong), of East Hampton, Conn., for an Improved Coffin Screw:

I claim the employment of plates, A, or their equivalent, for the purpose of securing or retaining the caps or covers, B, of coffin screws or tacks, substantially as set forth.

[Coffin screws are divided into distinct classes, one comprising real screws intended to fasten the parts of the coffin together, and one comprising imitation screws that serve only as ornaments and which are usually tacks with screw-like heads. This invention applies to both these classes, and it consists in a peculiar method of securing the cap or cover of the head of the screws or tacks after the latter have been inserted by passing the screws or tacks through round plates, the edges of which are beveled off or screwed, so that the caps can be driven on by a light blow or screwed on after the screws or tacks have been driven into their full length, and the caps are not injured in appearance by being placed thereon.]

24,912.—J. Y. Parce (assignor to himself and D. B. De Land), of Fairport, N. Y., for an Improvement in Hoisting Cranes:

I claim the main arm, E, of a crane, arranged with the double diagonal braces, I, and with the guide rollers, m, to operate in combination with the arm, E, jointed to the same by means of the oval pin, d, substantially as and for the purpose set forth.

[This invention consists in arranging the jointed arms of a crane in such a manner, by means of the particular form of the pin which joins the arms, and by rollers and braces, that the weight may be hoisted up or let down equally well in whatever direction the end of the jointed arm may be turned, and that the strain exerted by the weight on the main arm is brought to bear on that part of the same where it joins the post, on whatever side the end of the jointed arm, to which the weight is attached, may be turned.]

24,913.—Saml. R. Smith and Philander P. Lane, (assignors to Lane & Bodley), of Cincinnati, Ohio, for Improved Portable Sawing Machine:

We claim, first, The idle friction pulley, Z, operating substantially in the manner set forth, in combination with the arbor and feed driving a circular saw.

Second, In the described connection with the transverse rack, h, the gearing, q q', ratchet wheel, r, pawls, t, lever, s, and stop, v, which operate, by their rigidity, in one direction, to transmit a forward movement of the rack, h, to the knee, f, yet permitting the retraction of said rack, h, as set forth.

Third, The described arrangement and adaptation of the weighted eccentric friction pawl for the exact retention of the knee to the place of setting, as set forth.

Fourth, The described arrangement and adaptation of the perforated rack, h, pinions, q q', knee, f, and screen, y, for the exclusion of dust, as explained.

RE-ISSUES.

George H. Corliss, of Providence, R. I,, for an Improved Cut-off Gear. Patented July 29, 1851:

I claim combining with the rocking levers, or their equivalents for operating the valves, the shoulders on the spring bars, or their equivalents, substantially as described and for the purpose specified.

And I also claim, in combination with the shoulders on the spring bars that operate the rocking levers, substantially as described, the employment of the gage bars, or any equivalent therefor, to regulate the periods of closing the valves, whether the said gage bars be regulated by a governor or by other means, as set forth.

David B. Rogers, of Pittsburgh, Pa., for an Improvement in Railroad Car Springs. Patented Feb. 23, 1858:

I claim constructing a carriage or car-spring of a series of two or more plates of steel, each of which is so curved or twisted that the longitudinal curve on one edge or side of each leaf or plate, shall be the reverse of the curve on the other side or edge; a longitudinal section through the center of the plate, midway from either edge is a straight line or nearly so; said plates being so arranged relatively to each other that on both sides the curve at the edge of each leaf or plate, shall be in the reverse direction to the curve at the edge of the leaf or plate next above or below it.

James M. Cooper (assignee of S. W. Marston), of New York City, for an Improvement in Trigger-operating Revolving-breech Fire-arms. Patented Jan. 7, 1851:

I claim, first, So constructing the lock of revolving-breech fire-arms, in the mode substantially as described, or its equivalent, as that the trigger used to fire the pistol, when drawn back, raises the hammer to full cock and there retains it, the revolving breech or barrels being at the same time rotated so far as to bring the nipple of one of the chambers or barrels in the proper position to be struck by the hammer in its descent, and the trigger being held in a drawn position ready for instantaneous firing.

Second, The use of a fly-tumbler or vibrating tooth intermediate between the hammer and trigger, in trigger-operating fire-arms, and the peculiar arrangement of the parts of the lock in connection therewith, hereinbefore described, whereby the tendency of the main-spring to cause the descent of the hammer is neutralized when the hammer reaches the point of full cock, so that the hammer having been raised by the trigger, may either be permitted to stand cocked or fired immediately, at pleasure; and greater ease in firing and steadiness of aim are secured, substantially as described.

The Shelton and Osborn Skirt Manufacturing Co., of Birmingham, Conn., assignees of E. G. Atwood, of Derby, Conn., for an Improvement in Skeleton Skirts. Patented Oct. 19, 1858:

I claim a skirt formed of elastic hoops and tape, or equivalent material, when the tapes are disposed across the hoops in opposite diagonal directions, and interlocked on opposite sides of the hoops at the point of crossing, and are confined thereto, substantially as described.

I also claim connecting the hoops by means of a series of loops formed by a continuous tape, or equivalent material, passing around the skirt, from one hoop to the other, in opposite diagonal directions, without interlooping or interlocking between the hoops, substantially as described for the purpose set forth.

The Shelton and Osborn Skirt Manufactnring Co., of Birmingham, Conn., assignees of E. G. Atwood, of Derby, Conn., for an Improvement in Skeleton Skirts. Patented Oct. 19, 1858:

I claim a skirt formed of elastic hoops and tape, or equivalent material, disposed across the hoops in opposite diagonal directions, without being connected between the hoops, but connected to the hoops at suitable intervals, substantially as described.

EXTENSION.

Warren Hale and Allen Goodman, of Dana, Mass., for an Improvement in Shaping Irregular Surfaces in Wood. Patented July 22, 1845; Extended July 22, 1859:

We claim the method herein above described of copying or forming the longitudinal irregularities of piano-legs and other similar articles on rough blocks of wood, by means of a carriage moving longitudinally against the revolving cutter, and holding both the pattern and the rough block, the cutting tool being raised and depressed for depths of cut by rollers resting on the patterns, the whole method or modus operandi, being substantially as set forth.

ADDITIONAL IMPROVEMENTS.

Theodore F. Hall, of Marietta, Ohio, for an Improvement in Hanging Window Sashes. Patented Dec. 21, 1858:

I claim the improved arrangement of cords, pulleys and weights hereinbefore described, for hanging the sashes of windows so that either or both sash can be retained in any desired position in the frame, the sash and weights being suspended and moving on cords attached to the frame.

John Haw, of Old Church, Va., for an Improvement in Picker Sawing Machines. Patented June 23, 1857:

I claim attaching the saw-guides to the overhanging bearing so as to adjust them to the sawing of small logs, substantially as set forth.

DESIGNS.

John A. Munn, of New York City, for Design for Clock Cases.

David Hathaway (assignor to Fuller, Warren & Co.), of Troy, N. Y., for Design for Cook Stove.

George W. Pittock and John Pittock, of Union Mills, N. Y., assignors to —— Mosher and H. M. Chase, of West Providence, N. Y., for Design for Cook Stove.

William W. Stevens, of Westbrook, Maine, assignor to N. P. Richardson & Co., of Portland, Maine, for a Design for Parlor Cooking Stoves.

A MINE OF ANTIMONY.

We are indebted to a German monk, an alchemist of the 15th century—Basil Valentine—for the discovery of this metal. It is related that, having thrown some of it to the hogs, it purged them violently, after which they became fat; and, in the kindness of his heart, thinking that his brother monks might be benefited by a similar dose of this delightful medicine, he administered it. But the effects were fatal, for the monks died; hence, the medicine was called *anti-moine* or *anti-monk*.

The ancients also appear to have had some knowledge of this metal, as it is mentioned by Pliny, under the name of "stibium," which is much used in certain diseases at the present day. This metal, although suggestive of a vomit, is largely employed in the arts, such as in the preparation of some enamels and other vitreous articles, but principally in type and stereotype metals. It is wholly imported from foreign markets, and has a large consumption.

It is announced in the St. Clairsville (Ill.) *Gazette* that a vein of antimony, two feet thick, and almost solid, has been discovered within two miles of St. Clairsville. We hope this statement may prove true, as it will open another source of profitable industry in our country.

FAIR OF THE AMERICAN INSTITUTE.

This popular and useful annual exhibition of industry, invention, machinery and art, will be opened for the reception of goods on the 15th of September, at Palace Garden, in this city, and continue to receive until the 20th of the same month. The exhibition opens to the public on the 21st of September, and closes on Friday, 28th of October. The garden in which the exhibition takes place is far more central and convenient than the late Crystal Palace, being located between the Sixth and Seventh avenues, on Fourteenth and Fifteenth streets, and, although not quite so large as their former palatial exhibition-place, is still commodious enough to have a splendid fair, and give room enough for all. We hope inventors will send their machines early, so that the doors may open to the public with the exhibition in a fit state for their reception.

THE BRITISH GOVERNMENT AND SHARP'S RIFLE COMPANY.—An interesting suit in Chancery has been under trial for several weeks at Hartford, Conn., before Judge White, in which the parties are the British government and the Sharp's Rifle Company, of Hartford. From a statement of the case, published in the *Courant*, we have not been able to comprehend the whole subject in dispute, but we learn distinctly that the British claim $70,000 for money advanced on the property during a contract made in 1855 for rifles, and which was not fulfilled, and that the company deny they owe the British anything. These are the claims and the denial. The decision of the judge is not yet rendered.

RAISING VESSELS AT SEVASTOPOL.—The American company which were engaged by the Emperor of Russia to raise the sunken fleet of Sevastopol have been quite successful in raising 14 steamers and other vessels.

WE see it stated in some of the papers that an effort is on foot to bring Ex-commissioner Holt forward as a candidate for the Presidency.

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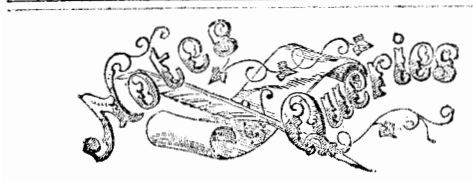

C. T. S., of Ohio.—We are glad to know that you, as well as many others, are so well pleased with the series now in course of publication upon the "Fathers of Philosophy." They are unquestionably interesting and instructive, and should be read by all. Aside from their historical value, many practical and useful lessons can be learned from them.

H. C., of Wis.—We are ready to proceed to prepare your application for the patent on the separator: but, as we told you before, we cannot offer you much encouragement to expect a patent. Booth's machine embraces all the important elements contained in yours, and your claim, if allowed, would be subordinate to his. If you will reflect a moment upon the matter as now presented, you will see the injustice of your surmises.

J. G. A., of Conn.—You had better employ us to make a preliminary examination in your car-coupling case, as it occurs to us that we have seen substantially the same device at the Patent Office. We could determine the matter by the examination, and it would cost you but $5.

G. H. A., of Detroit.—We can take up your case at once if you will send us your model, and will have your papers at the Patent Office within ten days' time if you will be prompt in returning them to us after their examination. You would have saved yourself unnecessary trouble and expense if you had applied for your patent promptly.

J. M. A., of Conn.—An application for a patent on a boiler similar to yours was made in 1855, and rejected. We can refer you to the party who made the application.

D. P. N., of Maine.—Your questions are difficult to answer, owing to the wide meaning of the word "principle," and the difficulty of determining what you mean by it; for it may signify the cause or origin of a thing or a mode of action. A principle, in the former sense, is not patentable, but in the latter sense it may be. A patent for a mode of action or system of operation may cover many different modes of effecting it. Letters Patent are not given for new applications of known rules of action or systems of operation.

J. A., of Penn.—A cylindrical form is the best for an air-pump, and about 300 revolutions per minute is a good velocity. Sperm oil is the best lubricator for such pumps.

W. W. T., of Ga.—If you employ dilute sulphuric acid instead of sal-ammoniac for biting the teeth of dull files, you will find success attend the trial. The files must be thoroughly cleansed from grease before they are placed in the acid, and they must be washed in hot water after they are taken out of it. About one pint of acid to six of water will make a bath of sufficient strength for the purpose.

G. B. D., of N. Y.—The coal gas used for illumination in our streets is generally employed for inflating balloons, because it is cheaper than hydrogen. Alcohol is never used for inflating large balloons, but it sometimes is for small ones.

H. G., of Ohio.—An American patentee, whether he introduces his invention into public use or not, can prosecute any person who infringes his patent. If you set up the defense, "his machine will not work," it will not avail you, because your use of the invention claimed in the patent will be proof against yourself that it is useful, and that it fulfills the conditions of the patent law.

W. J., of Pa.—A little beeswax placed on the outer wad of a shot-gun, and a drop on the nipple, will keep out moisture from the charge and keep the powder dry, provided the air cannot penetrate through the breech.

G. W. D., of Mo.—The Ericsson engine is very good for certain purposes, and if you do not want great power you will find it much cheaper than steam; but the first cost of the engine is much more than a steam-engine of the same power.

G. W. J., of Ky.—We have received your two essays on the theory of winds and rain, in which the latter is attributed to electric conduction, while the floating of clouds at a great hight is attributed to electric repulsion. You will find the very same theory set forth by D. Vaughan, on page 168, Vol. VIII., SCIENTIFIC AMERICAN.

S. H., of N. Y.—Your article upon the doom of the world is well written, but it is a very long reply to a few lines which we copied from a foreign journal. We consider it too theological and too lengthy for our columns.

J. A. B., of Ohio.—The sample of Tripoli which you have sent us for examination is of very good quality, but it has a very limited use in this city.

S. W., of Pa.—We never heard of glass tubing being used for chain-pumps, and do not think it would be serviceable unless made very thick and kept well protected.

A. A. L., of Va.—You will get information on the manufacture of oil from flax-seed from some manufacturer in Louisville, Ky., where it is extensively made; and the whole subject of Sorghum sugar and molasses you will find in Vol. XIII. SCIENTIFIC AMERICAN.

A. N., of N. H.—If you refer to page 76, Vol. XIII., SCIENTIFIC AMERICAN, you will find a full description of the process of making lead pipe. We cannot tell the probability of any patent paying, but we know that inventions of real utility are always in demand.

B. H., of Va.—The engine you mention is entirely unsuited for a steam plow. The best book on the steam-engine is Tredgold's large work; it is expensive, and can be obtained from John Wiley, bookseller, of this city.

J. S., of N. Y.—If you do not find 1,000 gallons of water in your condenser after evaporating this much from the boiler, you may depend upon it that there is a leak of steam somewhere. We cannot tell you where it is, but by careful searching you will no doubt discover it.

W. C. B., of Ill.—In a supplement of the SCIENTIFIC AMERICAN, a copy of which is sent you by mail, you will find a definite answer to your inquiry about the right of a purchaser to sell patented machines on territory not owned by him. The moon, in its course round the sun, describes a spiral. The moon exercises no effect upon vegetation except by an increase of light.

J. T. S., of Wis.—All steel tools are liable to become magnetized when they are rubbed on, or passed across, other steel surfaces. The only remedy we can suggest for your watch tools is to use several of the same kind, and as soon as one becomes polarized lay it down and take up another, the polarization of each being merely temporary.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, June 30, 1859:—

P. M. H., of Pa., $25; E. M., of Mich., $25; J. W., of N. Y., $30; T. H., of N. Y., $30; K. & S., of N. Y., $30; C. L. K., of Pa., $55; H. V. D., of ——., $15; F. D., of La., $150; F. McD., of N. Y., $30; K. V., of Mass., $40; S. B., of N. Y., $30; D. A., of N. Y., $20; V. L. M., of Pa., $10; W. K. & Co., of N. Y., $500; A. J. V., of Ohio, $25; C. & B., of Ohio, $30; C. W. P., of Texas, $25; B. & B., of Ill., $25; W. M., of Mass., $30; C. & N., of Cal., $5; C. W. B., of Mass., $25 C R P., Ohio, $30; T. F. W., of La., $300; W. S. T., of Iowa, $23; C. A. S., of N. Y., $30; N. J. K., of Ill., $25; G. B. S., of N. C., $75; C. W. R., of Ga., $25; A. L., of Mich., $30; J. P. A., of Ga., $30; E. D., of La., $50; S. B., of N. Y., $55; T. H., of N. Y., $25; V. H., of N. Y., $25.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, June 30, 1859:

L. E., of Conn.; A. J. V., of Ohio; P. H. H., of Pa.; C. & H., of N. Y.; J. S. L., of N. Y.; F. B. W., of N. Y.; D. & A., of Ill.; D. D., of N. Y., 2 cases; V. L. M., of Pa.; J. H. S., of N. Y.; N. J. K., of Ill.; V. H., of N. Y.; W. S. T., of Iowa; B. & B., of Ill.; E. T. S., of Cal.; S. B., of N. Y.; C. & N., of Cal.; C. W. B., of Mass.; E. D., of La., 2 cases; C. W. R., of Ga.; K. & F. of Texas; T. H., of N. Y.

Literary Notices.

THE MICROSCOPIST'S COMPANION. By John King, M. D. Published by Rickey, Mallory & Co., Cincinnati, Ohio.

This is a truly valuable work to all who wish to enter on one of the pleasantest fields of scientific pursuit, namely, microscopical investigation, which reveals to us worlds in a grain of sand and a system in a drop of water. It is well written and carefully compiled, credit being given to every author from whose works extracts have been made, which is a new and wholesome thing in American works on science, generally speaking. As far as the scientific accuracy and literary ability of the work are concerned, they are unexceptionable; but the mechanical portion—the engravings, printing and paper—is extremely poor for a book that deserves to take its place as a standard on its subject.

History of the Scientific American and Important Information to Patentees.

We have printed a supplementary edition of the SCIENTIFIC AMERICAN, in which there is a history of its rise and progress, with illustrations of the building, externally and internally, showing the spacious rooms in which our immense patent business is conducted, and with life-like representations of the artists, engineers and specification writers at their daily labors. The same paper contains information on the many intricate points arising in patent law and practice, and comprises the best popular treatise on the subject ever published; it should be in the hands of all who are interested either in procuring, managing or using patented inventions. The legal information contained in this paper is the result of FOURTEEN YEARS' experience as patent solicitors, and it cannot be found in any other treatise on patent law. It also contains information in regard to Foreign Patents and Extensions. It is published in octavo form, sixteen pages, and mailed upon receipt of two three-cent stamps. Address MUNN & Co., publishers of the SCIENTIFIC AMERICAN, New York City.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of our reception of their funds.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within the last fifteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

BINDING.—We would suggest to those of our patrons who have the last volume of the SCIENTIFIC AMERICAN complete, and desire to have it bound, that they had better send their numbers to this office, and have them bound in a uniform style with their previous volumes. Price of binding, 75 cents.

PRESERVE YOUR NUMBERS.—We often hear persons who have taken the SCIENTIFIC AMERICAN for the last dozen years, and preserved all the numbers since they commenced it, lament ing that they cannot procure the earlier volumes so that they may have the work complete. A few years hence there will be many who will regret they had not preserved the early numbers of the NEW SERIES; and that we may fulfill our whole duty to our patrons in this respect, we give them this early warning in regard to the first numbers of this volume. If the reader does not wish the numbers to bind for himself, undoubtedly, before the present year closes, the numbers can be sold at an advance above the cost, while he will have the benefit of a weekly perusal of the numbers which will cost him nothing. We counsel all to preserve their numbers.

Rates of Advertising.

Thirty cents per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement sent for publication.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—MESSRS. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure Patents for Inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other Agency in the world. The long experience we have had in preparing Specifications and Drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business we have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to Inventors. Any one can take out a Patent there.

A pamphlet of information concerning the proper course to be pursued in obtaining Patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office or either of the Branches. We also furnish a Circular of information about Foreign Patents.

The annexed letters from the last two Commissioners of Patents we commend to the perusal of all persons interested in obtaining Patents:—

MESSRS. MUNN & CO.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours, very truly,
CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements. Very respectfully,
Your obedient servant, J. HOLT.

Communications and remittances should be addressed to
MUNN & COMPANY,
No. 37 Park-row, New York.

TO INVENTORS, MACHINISTS AND MANUFACTURERS.—At great labor and expense we have prepared, for our own use, very extensive lists of the principal concerns engaged in every variety of trade and manufacture in the United States. We now propose to make these lists available to Inventors and others, for the purpose of addressing circulars, hand-bills, &c., to such parties as would be most likely to purchase their improvements or machinery. They comprise:—
Civil Engineers, Machinists, Blacksmiths, Carpenters, Carriage-makers, Agricultural Implement Dealers, Grist-mills, Saw-mills, Brickmakers, Builders, Hardware Dealers, Iron-founders, Printers, Painters, Druggists, Coppersmiths, Glass Manufacturers, Distillers, Bleacheries, Engravers, Bookbinders, Millwrights, Mining Companies, Boot and Shoe Dealers, Cotton and Wool Manufacturers, Paper-makers, Banks, Insurance Companies, Hotels, Country Stores, Patent Agents, Nurserymen, Tanners and Currriers, Brewers and Maltsters, Stove, Range and Furnace Dealers, Plumbers, Soap-makers, Cabinet-makers, Upholsterers, Steam-engine Builders—besides a complete list of Master Mechanics, and Superintendents on all the Railroads in the United States, and numerous other valuable and complete lists. Terms, $5 per 1,000. Probably this is the most effectual and at the same time economical means which can be used to promote the interests of trade generally. LEAVITT & CO.,
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STEAM ENGINES, LATHES, PLANERS AND DRILLS, of every capacity, and MACHINISTS' TOOLS of every kind, from the best manufacturers, for sale by
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STEAM BOILERS FOR SALE.—NEW AND Second-hand Boilers, from One to Twenty-horse Power. Enquire or address WM. FINNEY & CO.,
6 6t* No. 167 Water-street, Brooklyn, L. I.

SUGAR-MAKING IMPLEMENTS.—PARTIES intending to make, or desirous of making Cane Mills or Sugar Apparatus of any kind, can get Rights to use Hedges' Improvements, with valuable information in reference to patterns, different modes of construction in order to make the work profitable at the established prices, and at the same time to secure to purchasers the very best Machinery, &c., together with an advertisement in our "Treatise on Sugar Cane," which will at once secure to them a share of our custom. All for a great deal less than experience, without such hints as we can give, will cost them. Hedges' Mills are very superior. Territory and Shop Rights for Cook's Evaporator for sale.
6 4t* HEDGES, FREE & CO., Cincinnati, Ohio.

THE GREATEST POWER KNOWN FOR THE Cost and Weight of Instrument.—Heavy Presses, adapted to all purposes, of any capacity; the power applied up, down, or horizontal. Hand Presses, light and heavy; Lifting Jacks, all sizes; one of two pounds weight with a two-inch lever warranted to lift one tun; also, Punches for Boiler-makers, on an entirely new principle. Address
6 6t* DAVID L. MILLEN, Madison, Morris Co., N. J.

GUTTA-PERCHA.—AUSTRIAN, FRENCH, Russian and Spanish Governments.—Wanted—Parties to cover with Gutta-Percha Gomez & Mills' Patent Submarine Electric Fuse-train, for the above Governments. For particulars and samples inquire of E. GOMEZ, No. 165 Broadway, New York. 6 1t*

PATEFT SUBMARINE ELECTRIC SAFETY-FUSE TRAIN.—Can be used in place of the galvanic battery for military and civil purposes. For sale at No. 165 Broadway, New York. [6 1t*] Inquire of E. GOMEZ.

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6 5t* J. E. MITCHELL, No. 310 York-avenue, Philadelphia.

C. L. GODDARD, AGENT, No. 3 BOWLING Green, New York. Only Manufacturer of the Steel Ring and Solid Packing, Burring Machines and Feed Rolls for Wood Cards, &c. 6 1t*

COAL-SAVING AND SMOKE-CONSUMING.—T. HODGSON, No. 7 Beach-place, Brooklyn, offers the free use of his invention to any one putting up a boiler (not tubular) that will fix the grate after the manner of his invention, and save upwards of 50 per cent. of fuel, 6 1t*

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PATENT EXTENSIONS.—ALL PATENTS FOR Inventions, granted by the United States during the year 1845, will expire by their own limitations during the current year (1859) UNLESS EXTENDED ACCORDING TO LAW. The statute provides for the extension of Patents for an additional term of SEVEN YEARS, the grant being made to the inventor himself, or if deceased, to his heirs and administrators. The EXTENDED TERM enures solely to the benefit of the inventor or his heirs. Assignees or owners of rights under the first term of the Patent have no rights whatever in the extended term. The inventor or his heirs may, however, sell their interests in the Extension prior to the grant thereof, in which case the Extended Patent, when granted, becomes the exclusive property of such purchaser. Applications for Extensions must be made at the Patent Office at least 60 days paior to the extension of the Patent. The undersigned, having had great experience in Patent business, will promptly prepare the various documents and prosecute Extension cases on moderate terms. For further information address

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APPEALS BEFORE THE JUDGES OF THE U. S. District Court, from the final decisions of the Patent Office, in Rejected Cases, Interferences, &c., are prosecuted by the undersigned on moderate terms.

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[From the Scientific American, July 2, 1859.]

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BALL'S OHIO MOWER AND REAPER, AS IMproved for 1859, is the best and most saleable one made in the United States. For shop rights, Territory or machines, apply to
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SPALDING'S PREPARED GLUE.—SAVE THE pieces—Economy—Dispatch! "A stitch in time saves nine." As accidents will happen even in well regulated families, it is very desirable to have some cheap and convenient way for repairing furniture, toys, crockery, &c. Spalding's Prepared Glue meets all such emergencies, and is always ready and up to the sticking point. It is just the article for cone, shell and other ornamental work. It is used cold, being chemically held in solution, and possesses all the valuable qualities of the best cabinet-maker's glue. "Useful in every house." N. B.—A brush accompanies each bottle. Price, 25 cents. Wholesale depot, No. 30 Platt-street, New York. Address H. C. SPALDING, box No. 3,600 New York. Put up for dealers in cases containing four, eight and twelve dozen, a beautiful lithograph show-card accompanying each package. Sold by all prominent stationers, druggists, hardware and furniture dealers, grocers and fancy stores. Country merchants should make a note of Spalding's Prepared Glue, when making up their Fall list. 4 4*

GREAT CURIOSITY.—WE HAVE ONE OF THE greatest curiosities and most valuable inventions in the known world, for which we want agents everywhere. Full particulars sent free. [4 5*] SHAW & CLARK, Biddeford, Maine.

MARINE RAILWAY.—WANTED, A COMPEtent man, who is able to invest a few hundred dollars in a Marine Railway, and take the entire charge of the same. The works are nearly completed, and are situated in a flourishing city in Florida; this is a favorable opportunity for a ship-carpenter wishing to engage in the business, as there would be plenty of business in the way of repairing and building vessels. For particulars in regard to location and prospects, inquire of J. HOLMES, No. 88 Wall-street, New York. 3 4*

MEN OF MEANS DISPOSED TO ENGAGE IN business or to invest in profitable mechanical enterprises, may generally learn of good opportunities, with reliable information concerning them, on application to LEAVITT & CO.,
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YOUR NAME IN GILT LETTERS (ADHESIVE). Size 1 inch, one cent each; 2 inches, two cents; 3 inches, three cents, &c., with red stamp to pay return postage. Grand Chance for Agents!—12 Alphabets, one inch, for $1; two inch, 8 for $1; three inch, 5 for $1—assorted colors. Address
5 3t GEORGE K. SNOW Boston, Mass.

THE TWELFTH ANNUAL EXHIBITION OF the Maryland Institute for the Promotion of the Mechanic Arts. The Managers of the Maryland Institute announce another of their popular Exhibitions of Works of Art and Industry, to be opened in the great Hall of the Institute, in the city of Baltimore, on TUESDAY THE 4TH DAY OF OCTOBER, 1859 and continue for four weeks. Manufacturers, Mechanics, Artists Inventors, and all others desiring to display their respective productions, are cordially invited to contribute. Circulars containing particulars will be furnished by application to JOHN S. SELBY, Actuary, who will also promptly give any desired information on the subject. Those who desire to become depositors are respectfully requested to make early application for space, that the committe having charge of the exhibition may make their arrangements understandingly. SAML. HINDES,
5 2t* Chairman of Committee on Exhibition.

WARTH'S SELF-ACTING WOOD-TURNING LATHES.—The best and most practical now in use; one boy will accomplish the work of four men. State and County rights for sale. Address A. WARTH, care of W. H. Bertling, No. 23 Chambers-street, New York, or the manufacturers, who have machines of all sizes on hand. Also a general assortment of machinists' tools. Circulars sent. Address CARPENTER & PLASS, No. 479 First-avenue, New York. 6 3*

NAVY YARD, BOSTON, JUNE 16, 1858.—F. K. SIBLEY, Esq.—Dear Sir: Having given your Emery and Crocus Cloth a thorough trial, it gives me pleasure to inform you that I consider it the best article that I have seen. Yours very respectfully, SETH WILMARTH, Superintendent of Machinery.

U. S. NAVY YARD, Portsmouth, N. H., May 29, 1858.

Having used F. K. Sibley's Improved Emery and Crocus Cloth for the past year, I fully concur in the above statement.

N. D. MILLER, Master Machinist and Steam Engineer.

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CROSSETT'S PATENT STAVE CUTTER—PATented July 1, 1844; re-issued March 2, 1858; renewed and extended June 26, 1858.—The above mentioned machine is warranted to cut more and better staves than any other machine in the United States, and is the most simple, cheap and durable. I hereby caution all persons against using and vending said machine (the main features of which consist in the stationary knife and vibratory bed-piece) without the legal right to do so. Offenders will be dealt with according to law. All persons wishing an interest in the extended term of said patent can obtain it by addressing the undersigned at Joliet, Ill.
5 10 GEO. I. CROSSETT, Assignee.

THE AUBIN VILLAGE GAS WORKS WERE erected last year by gas companies in several States and in Canada. The success attending these works has already led to the erection of one city and one village work this season, has secured three village works for immediate erection, and so nearly secured five more that they may be relied on before August next. For reference apply to the Aubin Company, No. 44 State-street, Albany, N. Y. 1 13

CALIFORNIA AGENCY FOR PATENTS.—WETHERED & TIFFANY, San Francisco, will attend to the sale of patent rights for the Pacific coast. References:—Messrs. Tiffany & Co., New York; Wethered, Brothers, Baltimore; George W. Bond & Co., Boston. 4 13

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A MESSIEURS LES INVENTEURS—AVIS IMportant.—Les inventeurs non familiers avec la langue Anglaise, et qui prefereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront recues en confidence.

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TO INVENTORS AND PATENTEES—A. B. ELY, Counsellor-at-Law, Traveler Building, Boston, Mass., will give his personal attention and experience of fifteen years to consultations and trials in all matte elating to the law of patents, interferences, infringements, &c. 1 9*

Zur Beachtung für Erfinder.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu adressiren an

Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.

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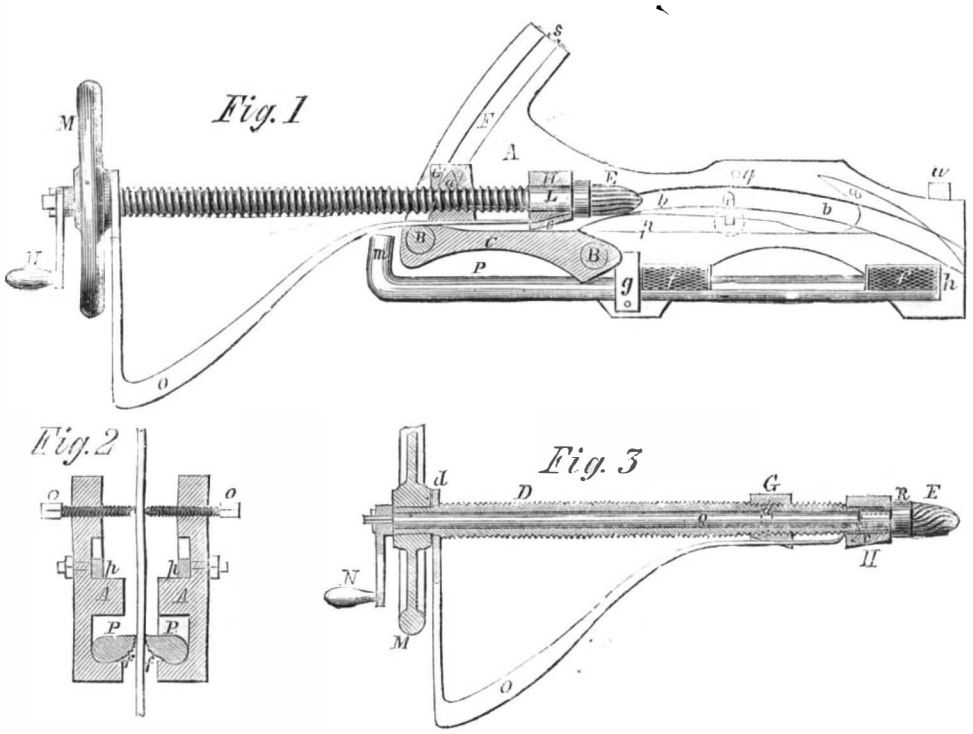
IMPROVED MACHINE FOR CUTTING TEETH IN SAWS.

By this machine the teeth of circular as well as straight saws can be cut with equal facility. In our engravings, Fig. 1 is a longitudinal vertical section through the machine, Fig. 2 is a vertical cross section, and Fig. 3 is a longitudinal section through the screw-shaft.

A are two metal plates secured together by means of the screw-bolts B. C is a metal bed-piece secured between the plates A, by the screws B, passing through it, and which serves as an anvil for the saw tooth to rest upon while being sharpened. D is a screw-shaft which has its bearings in the nuts G, and H, in such a manner that it can screw through the nut G, while its bearing in the nut H, is smooth, and it is held therein by a pin I, which permits the screw to turn. M represents a hand-wheel which is keyed on to the end of the screw-shaft D, and by which it is turned. Q is a round shaft fitted within the hollow screw-shaft D, in such a manner that it can be turned independently of the screw by means of the crank N, and the head R, of the shaft Q, turns in the nut H, as its bearing. E is the cutting tool, or burr, which cuts the saw-teeth; its shank is secured within a socket of the head R. It will be seen that the burr E, is operated by turning the crank N, while its feed is effected by turning the hand-wheel M, and screw D. The plates A, are formed on their inner sides with two sets of grooves, F, and *b*; the groove F, is intended to guide the nut G, in its upward motion, which is done by the tongue *a*, of the nut G, fitting in the groove, while the nut H, moves along the groove *b*, by the action of the tongue *c*, playing in the groove *b*. *p* is a curved switch which constitutes one side of the groove *b*, and which is secured to the plate A, by means of a screw-bolt and nut; the bolt passing through a slot *r*, and when the screw-nut is loosened, the bolt can be moved in the slot *r*, and the switch can be moved until the groove *b*, is closed and a rectilinear groove is opened in which the tongue *c*, can travel, and which is used when a straight saw is to be operated upon, while the curved groove, *b*, is used for circular saws.

O is a bent connecting bar, the hub, *d*, of which is hung loosely upon the neck of the screw-shaft D, while its thin end is secured within or to the nut H; the lower face of this bar, O, rests and can slide on the bed-piece, *i*, while its upper face exerts a pressure upon the nut C, and pushes it upward in the groove F. P are two cylindrical rods which are formed with griping jaws, *f*, to hold the saw firmly; the rods P, have their bearings at *g*, and *h*, in the plates A, and can be turned in said bearings by means of their curved ends, *m*, to open and close the jaws *f*. *o o* are two set-screws which are intended to hold between them the saw tooth next to the one which is operated upon, to prevent the saw from vibrating. *s*, and *u*, are clamps for clamping the plates A, together when the saw is secured between them.

The operation of this machine is as follows:—The saw, represented in outline, Fig. 1, being a circular saw, is held between the griping jaws, *f*, and the tooth to be filed or shaped is placed on the anvil C, in the manner represented. The saw is then clamped by the set-screws O, and the burr E, is operated by turning the crank N, and thus cuts away the back of the tooth; by turning the hand-wheel M, the screw D feeds the burr to its work, but at the same time it moves the bar O, forward, which raises the nut G, and thus causes the shafts D, and Q, to turn on the tongue, *c*, as their fulcrum, and thus the position of the burr E, is changed as the work progresses, in such a manner as to correspond to the curved shape of the back of the teeth of a circular saw, whereby the burr can operate effectually on the teeth. For sharpening a straight saw, the bar O is removed and the switch *p*, is moved up so as to close the groove *b*, and open a straight groove below it; the tooth to be sharpened is then placed again on the bed-piece C, and the burr will now be fed in a rectilinear direction, as the tongue *c*, will follow the straight groove; the set-screws *o*, are inserted into the holes *q*, for clamping the tooth next to the one sharpened, and the operation can now proceed without any further change in the machine, which is thus arranged for forming the teeth upon straight as well as circular saws.



KINNE'S MACHINE FOR CUTTING TEETH IN SAWS.

This ingenious device is the invention of K. H. Kinne, of Mexico, N. Y., and he obtained a patent June 21st, 1859. He will be happy to furnish any further information upon being addressed as above.

ADMINISTERING CHLOROFORM.—The administration of chloroform is still, it is to be feared, too often entrusted to the hands of inexperienced persons, who are not sufficiently conversant with the indications of danger, or the means of averting it. There are many who still think that chloroform may be administered conscientiously upon a loose handkerchief, without any means being taken to regulate exactly the intensity or the quantity of the dose. We are of another opinion. It is true that there are a few men of large experience, who have, by observation, attained to a sort of rule of thumb, and who are enabled to manage the handkerchief so as to admit always a good and sufficient proportion of atmospheric air. But these are exceptional in their power; and it is certainly not desirable that others should pass through the dangerous training necessary to attain the like dexterity.—*Lancet.*

THE NEW STAMPED ENVELOPE.

In No. 34, Vol. XIII. SCIENTIFIC AMERICAN, we noticed this new invention under the title of a self-ruling envelope; and we have the pleasure of stating that it has been adopted by the Postmaster-general, and it will soon be for sale with the stamped envelope now in use. As it is an invention of interest to the business community in the country, we present herewith an engraving illustrating its construction and peculiarity.

Fig. 1. represents the new envelope before it is folded, or after it has been ruled ready for folding, and Fig. 2 the back, after the side and under wings are folded. The inside of the under wings receives the black lines; the side wings lap over these, so as to form a double thickness of paper over the black lines, thus concealing them from view on the back.

Fig. 1

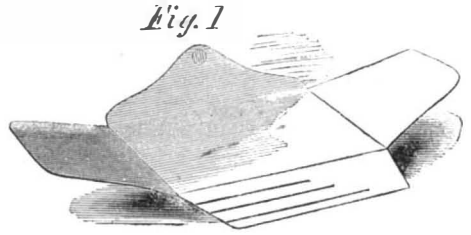
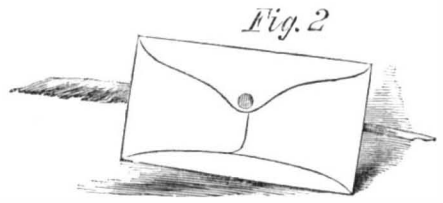


Fig. 2



On the front of the envelopes, there is but one thickness of paper over the black lines, and by pressing the face down, they are clearly visible. These lines form an admirable guide for the superscription. The letter, when inserted, is of course placed between the lines and the front face of the envelope, and completely conceals the lines from view.

The main object or the improvement—and it is a desirable one—is to supply the convenience, while obviating the insuperable objection to ruled envelopes proper.

Those persons who prefer to superscribe their letters without the aid of the ruled lines, can insert the letter before doing so. The improvement will doubtless be engrafted upon the letter-envelope generally, both in this country and Europe; as in the latter the common ruled piece of paper is still in use, and the subject of our illustration has all its advantages without its inconveniences

BILL'S PISTON PACKING.—In our description of this invention on page 38 of the present volume of the SCIENTIFIC AMERICAN, we should have said that the packing can be set out without removing the cylinder head, and that H. A. Miller, of No. 15 William-street, New York, would also furnish particulars.

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